

DENTAL
APRIL, 1947

American Journal of Orthodontics and Oral Surgery

FOUNDED IN 1915

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Office of the Editor: 8022 Forsythe Boulevard, St. Louis
Published by The C. V. Mosby Company, St. Louis

American Journal of Orthodontics and Oral Surgery

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VOL. 33

APRIL, 1947

No. 4

Original Articles

THE LIMITATIONS OF ORTHODONTIC TREATMENT

I. MIXED DENTITION DIAGNOSIS AND TREATMENT

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INTRODUCTION

AMONG the many problems which exist to perplex the orthodontist, there is perhaps none more challenging than the one of mixed dentition diagnosis and treatment. The correct answer is equally elusive when the dilemma is encountered in the slightly different guise of "time for treatment." This paper will evaluate certain methods of diagnosis and treatment which have been used for the younger patient, and it will present evidence consisting of accurate measurements made upon many cases, treated and untreated, which have been followed in serial fashion over a number of years.

The last fifteen years have seen a gradual emergence of a new philosophy among orthodontists—an increasing awareness that all things desirable in orthodontic treatment are not possible even to the most skilled and best-informed operator, a realization that to varying degrees different patients present different potentialities with respect to the attainment of orthodontic objectives.

The character and the extent of these limitations will be elaborated upon later, both in this paper and in one which is to follow. For the moment it will

Read before the Southern Society of Orthodontists, Charlotte, N. C., Jan. 28, 1946.

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suffice to say that the last decade and a half were preceded by an era of unbounded optimism in regard to the outcome of treatment which, when viewed from the vantage point of hindsight, was unjustified. The assumption was commonplace that orthodontic treatment, either directly, or indirectly through improved function, stimulated the growth not only of alveolar process, but also of the portions of the maxilla and mandible further removed from the immediate environs of the teeth. Not only was this assumed to be true, but it was also generally believed that the beneficial effects of orthodontic treatment even extended to other bones of the face, so that it was within the scope of the orthodontist to give new faces to his patients. Men endowed with capabilities such as these could scarcely contemplate compromise measures such as the removal of teeth, and public censure was the reward of those who saw fit to violate these tenets of orthodontic practice; how could it be wise to remove teeth to make room for others when it is possible to induce facial growth through therapy and make room for all?

These euphoric assumptions had a profound effect upon the decision as to the proper time to treat. If it were true that malocclusion inhibits facial growth and that orthodontic treatment enhances growth or restores it to normal levels, it would be well-nigh criminal to fail to treat any malocclusion once recognized as such. Accordingly, it became the practice of orthodontists to take children at an early age, instituting either prolonged or intermittent therapy which, in some offices, spanned the years from the preschool age to high school graduation.

SCIENTIFIC AND CLINICAL EVIDENCE

In the last twelve years there has been produced scientific as well as clinical evidence to show that these earlier suppositions of unlimited success were far too optimistic.

Broadbent, by introducing the roentgenographic cephalometer, a precision instrument permitting exact and accurate study of the processes of facial growth and the results of orthodontic treatment, made a major contribution to the understanding of the relative roles of growth and treatment. In private discussions, Dr. Broadbent has told the author that a large portion of his orthodontic practice is devoted merely to observation and supervision, without treatment. My own experience, entirely clinical, has led me to the same conclusion: that "hands off" is frequently the best policy.

In 1938, Brodie¹ and his co-workers made a preliminary report on the cephalometric appraisal of orthodontic results. Their findings may best be cited by means of direct quotations: "Tooth movement does not seem to be as great as clinical observation has led us to believe. Apparently, growth and development count for a considerable part of the changes which take place during orthodontic treatment." Later in the report one may find these words: "Actual bone changes accompanying orthodontic management seem to be restricted to the alveolar process."

This clinical study, conducted in accordance with the methods of science, was later amplified by an exhaustive study of the growth of the human head

by Brodie,² a report of which was published three years later than that on the cephalometric appraisal of clinical results. It showed that inherent growth tendencies cannot be depended upon to augment the ministrations of the orthodontist to convert an undesirable basic facial pattern to an harmonious one, since he found that craniofacial pattern is established at birth and changes but little thereafter.

Had the orthodontists of the twentieth century been sufficiently aware of a classical piece of work reported more than one hundred years ago, they would have realized that they were expecting the impossible of the processes of normal facial growth. John Hunter, in 1771, after extensive investigations with a method which revealed precisely the sites of new bone growth, made the following statements which are quoted by Brash:³ "The jaw still increases in all points till 12 months after birth, when the bodies of all the six teeth are pretty well formed; but it never after increases in length between the symphysis and the sixth tooth; and from this time, too, the alveolar process, which makes the anterior part of the arches of both jaws, never becomes a section of a larger circle. . . . After this time the jaws lengthen only at their posterior end. . . ."

Another recent student of occlusion and facial harmony, interested almost exclusively in the clinical side of the picture, was also turning a critical eye upon the field of orthodontics. In 1941, Tweed⁴ wrote: "It is evident that most orthodontists believe that if they establish a reasonably satisfactory cuspal relationship, regardless of axial inclination of the relation of teeth to their respective bony bases, occlusion will invariably direct the growth processes so that the maxillary and mandibular base bones will themselves grow forward and under the mesially positioned teeth. I wish this were true. . . . I waited for years for the stimulation of occlusion to develop bases under the protrusive dentures of some of my patients, and in most of these cases I am still waiting."

CONVENTIONAL MIXED DENTITION TREATMENT

The following description will fit many of the mixed dentition cases which come to the orthodontist for treatment:

1. Crowded or rotated permanent mandibular anterior teeth, satisfactorily placed over basal bone.
2. No marked facial deformity.
3. Mesiodistal molar relationship normal or close to normal.
4. No posterior teeth lingually or buccally placed as related to their antagonists.

Cases of this sort were routinely considered by orthodontists to be active treatment cases and, up to the year 1934, were so considered by myself. The usual procedure was to expand in width and length until there was sufficient space for all mandibular permanent and deciduous teeth then present to rest in the alveolar process, in nonrotated positions. When this was attained, the case usually had the following characteristics:

1. Mandibular incisors were too far forward.

2. The labial investing tissues over the mandibular incisors seemed to be too thin, and the outline of the roots could often be seen or felt. This was, of course, only further evidence of having moved these teeth too far forward.

3. First permanent molars still in end-on occlusion.*

4. The axial inclinations of maxillary anterior teeth were not good: these teeth appeared to "reach" for occlusion with the mandibular anteriors.

These rather unsatisfactory results might have been tolerated with better grace had subsequent events shown that something had been gained by mixed dentition treatment. Too often, however, by the time the permanent canines and premolars erupted, the case was once again a bad malocclusion and it was evident that the patient was worse off than if there had been no former treatment. This experience was not uniquely my own; discussions with and study of records of other orthodontists capable of self-criticism disclosed that they also met with this sort of disappointment.

Looking backward upon that period from the vantage point of more recent experience, it is clear that we can attribute this unsatisfactory and unstable end result to overexpansion, particularly the excessive labial movement of mandibular incisors. We know that too much arch length was gained; if it had been assiduously held, spaces remained upon the eruption of the permanent teeth. These spaces could be closed only in two ways: lingual movement or uprighting of mandibular incisors, which is eminently desirable, or mesial movement of first molars. The comparing of repeated measurements made upon a variety of models in many different offices made it altogether clear that the latter tendency, a forward positioning of the mandibular first permanent molars, is a natural one which may be expected in every case in the transition from the mixed dentition period to the permanent. What these measurements consist of, and the interpretations put upon them, will be considered later in this paper.

FIRST REALIZATIONS OF A PRACTICAL SOLUTION

Since it was evident that the fault lay in no minor errors of orthodontic therapy, and since undesirable consequences followed treatment with different types of appliances, not only in my hands but in the hands of others, I sought to solve this problem of room for teeth by attacking it at the simplest level: studying the sizes of teeth; first, those of the mixed dentition, and then, the altered amount of tooth material occasioned by the substitution of permanent canines and premolars for their deciduous predecessors. This involved the measurement of individual teeth upon many models, using fine-pointed dividers and laying the tooth diameters off with those dividers on small cards.

I am frequently asked how long my practice has been governed by the views which I now advocate with regard to mixed dentition treatment. Although I cannot claim that my present rationale of mixed dentition treatment extends back to February, 1934, its beginnings may be traced to that date.†

*As will be explained later, this "end-on" relationship of first permanent molars characterizes the mixed dentition period.

†Deciduous mandibular canines were deliberately removed for the first time in my practice in February, 1934, in a case treated actively in the mixed dentition (Figs. 12, 13, and 14).

It was then that the fact became evident to me that we were seeking by the methods used at that time to gain, by accommodating in nonrotated positions all of the teeth of the mixed dentition, arch length in excess of the requirements of the case a few years later. In other words, the denture was seen as a static thing, without taking into account the fact that deciduous canines and molars would be replaced in time by teeth smaller in size.

Fig. 1.

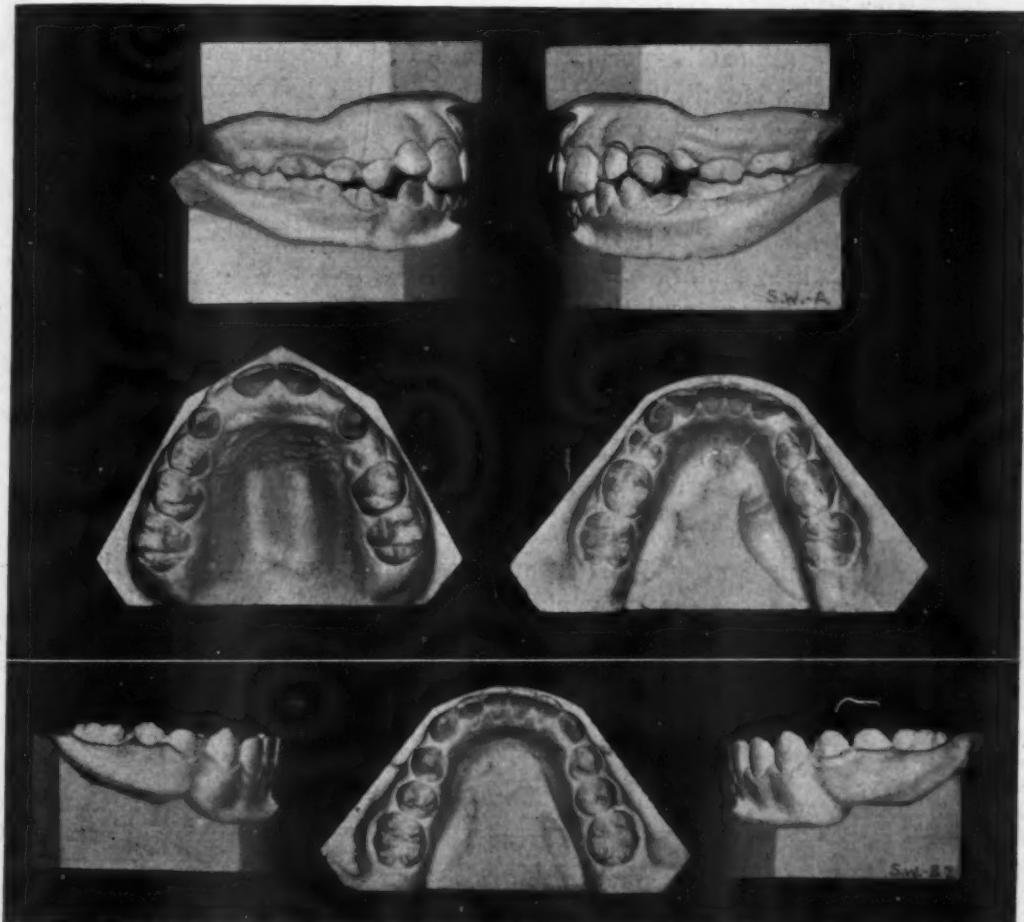


Fig. 2.

Fig. 1.—An early case of the removal of a mandibular deciduous canine as a preventive measure. The mandibular right deciduous canine was lost through natural causes: note that the mandibular incisors have drifted partially into the space, thereby aligning themselves in a regular fashion. The left mandibular deciduous canine was ordered removed. No active treatment was ever necessary in this case; a passive lingual arch was placed after removal of the left deciduous canine.

Fig. 2.—The case shown in Fig. 1, after the loss of deciduous teeth. Mandibular incisors have shifted to the left, thereby correcting the midline, without orthodontic treatment. Note spaces on both sides for forward positioning of first permanent molars.

DELIBERATE AND PREMATURE REMOVAL OF DECIDUOUS CANINES

The first "preventive" case in which I utilized mandibular deciduous canine room implemented my formative ideas concerning this method for accommodating permanent teeth in nonrotated positions, for the case pre-

sented with the mandibular right deciduous canine prematurely lost. The first permanent molar relationship was slightly end-on, and the mandibular incisors were regular, due to the fact that they had drifted into the space created by the loss of the right deciduous canine, until that space was more than half closed. (Fig. 1.) A carefully made lingual arch was adapted to the mandibular teeth to maintain the distance between the first molars and incisors. Upon the eruption of the permanent canines and premolars, there was room on the right side, despite the loss of over half of the width of the deciduous canine, to accommodate all of the permanent teeth from the midline to the mesial of the first molar. Mandibular incisors shifted to the left without orthodontic treatment, thereby correcting the midline and providing space on the right side for forward positioning of the first permanent molar. On the left side, where the full deciduous canine width was maintained, spaces were distributed between the teeth. (Fig. 2.) Upon removal of the lingual arch, these spaces closed and the first molars assumed their normal relationships. No further treatment was required and the mouth and face remain as beautiful as any I have had in my practice. (Figs. 3 and 4.)

The reason for the success of this case lies in a fundamental fact concerning the human dentition. This fact is that the sum of the mesiodistal widths of the mandibular deciduous canine and molars, of each side, exceeds, by varying amounts in different individuals, the sum of the mesiodistal widths of the teeth that succeed them, mandibular permanent canine and premolars.

It was not until after I had spent many hours measuring widths of deciduous and permanent teeth, on plaster models, for the purpose of establishing average widths, that I recalled the work done by Dr. G. V. Black along this line. In Black's *Dental Anatomy*⁵ one may find tables giving the average mesiodistal crown widths of all teeth of the human dentition.

These figures are published by Black:

TABLE I

MANDIBULAR DECIDUOUS TEETH		MM.
Average mesiodistal crown width of canine		5.0
First molar		7.7
Second molar		9.9
Total		22.6
MANDIBULAR PERMANENT TEETH		MM.
Average mesiodistal crown width of canine		6.9
First premolar		6.9
Second premolar		7.1
Total		20.9
Difference		1.7

If this average difference, or "leeway," obtains equally on each side, the total difference is 3.4 mm., twice that of each side. This leeway in some cases amounts to as much as 4.0 mm. on each side, and in at least one case measured, the total mesiodistal widths of deciduous teeth equaled only that of the per-

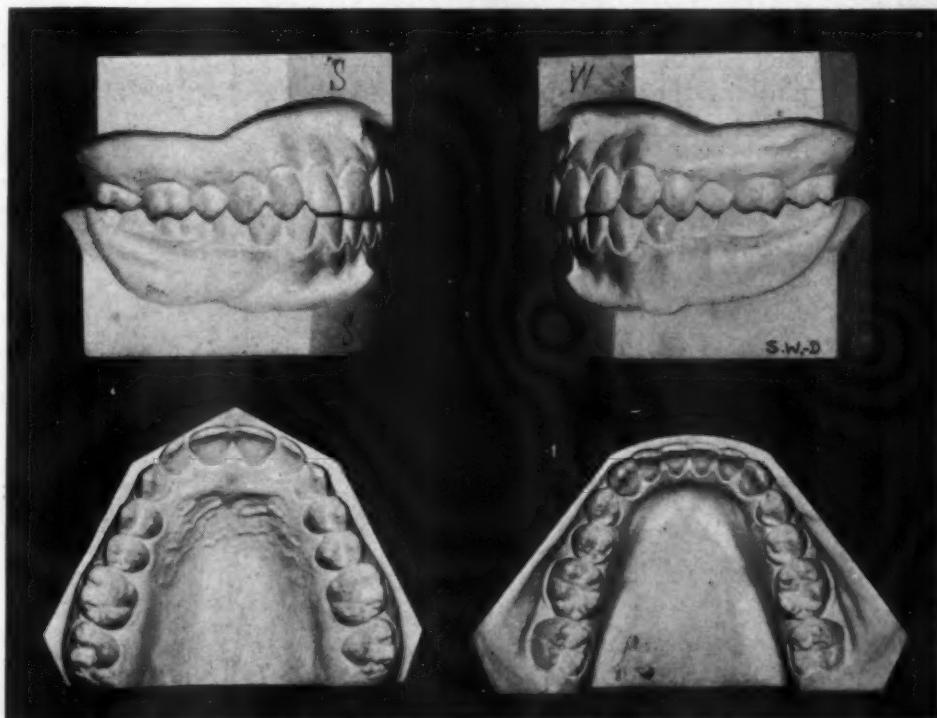


Fig. 3.—The case many years later. See facial photographs in Fig. 4.



Fig. 4.—Profile photographs corresponding to the models shown in Figs. 1 and 2. No active orthodontic treatment was ever necessary for this patient.

manent teeth; that is, leeway amounted exactly to zero. As the clinical usefulness of such measurements is developed, it will become apparent that not only must the leeway be taken into account, but also the amount of crowding or labial tipping in the mandibular arch and the occlusal relationships of the first permanent molars.



Fig. 5.—The everyday equipment needed to make the measurements described in the text. The dividers are used to determine the mesiodistal widths of deciduous teeth on the model and of their permanent successors in the dental x-rays. The inside measurement (see text) is also determined with the dividers. The brass wire is adapted to the model with the arch-bending pliers and is cut off with the scissors. This determines the outside measurement (see text and Fig. 6). Measurements of mesiodistal widths are recorded on the 3 by 5 card, which is preserved for future reference along with the brass wire which is placed in the coin envelope.

DETAILED PROCEDURE FOR MEASURING MESIODISTAL WIDTHS

The armamentarium necessary for making these measurements is modest and is shown in Fig. 5. The mandibular models and the x-rays form the basis of all measurements taken. The dividers should be sharp-pointed for the most accurate determination of mesiodistal widths. Measure the mesiodistal widths of the two deciduous molars and the deciduous canine (or better, the amount of space which those teeth are occupying in the dental arch) very accurately with the dividers, and transfer the measurements to one of the ruled lines on the 3 by 5 card. Place an ordinary blotter beneath the card, and keep the holes pricked into the card as small as is consistent with clear visibility. As each tooth is measured, transfer the width to a line on the card and put the next tooth measurement directly in line with it so that one point of the divider enters a hole made by the previous tooth measurement. If a tooth is blocked

out of the arch (when this occurs it is nearly always the mandibular deciduous canine), do not take the width of the tooth itself but take the space available for that tooth. For example, if the mandibular canine is excluded from the arch, then one should measure the distance from the mesial of the mandibular first deciduous molar to the distal of the mandibular permanent lateral. Obviously, we are interested less in the size of these teeth than we are in the amount of room ultimately available for their permanent successors.

Full-mouth x-rays are used for determining the mesiodistal widths of the unerupted permanent successors. The accuracy of these measurements depends upon the absence of distortion in the films; therefore, x-ray technique is very important. The central ray of the tube should pass directly between the contact points of the teeth being x-rayed. Whether or not this has been accomplished is readily evident from inspection of the films. If the contact points of the teeth show no overlapping in the film, the rays have passed straight through them. If, on the other hand, the contact points have not been opened up in the x-raying, the rays have not gone straight through, and the measurements of the mesiodistal widths of these unerupted teeth are less reliable.

The same dividers are used in determining the greatest mesiodistal widths of the permanent teeth, canines and premolars, lying unerupted in their crypts. These measurements are laid off, a tooth at a time, on another line of the same card as were those of the deciduous teeth.

Occasionally, factors beyond control will introduce minor difficulties to this procedure. For example, a premolar may be rotated in the crypt so that another diameter than the normal mesiodistal width is presented on the film. In this event one cannot obtain a true mesiodistal measurement. The simplest solution then is to take the measurement of the tooth of the opposite side. In the event that neither of these teeth is available for accurate measurement, one may then use the Black averages, given in Table I above, to supply the missing figure. If, for example, the mandibular first premolar is not readily measured in the x-rays, one can assume that it has the same mesiodistal width as the canine, since in the average case the canine and the first premolar have the same mesiodistal width. If the teeth that you can measure are slightly larger than average, then you may add the indicated amount to Black's averages to get the mesiodistal widths of teeth that cannot be directly measured from the x-rays. Other manipulations of these averages which would supply, with sufficient accuracy, dimensions not directly measurable will readily suggest themselves. For example, if one cannot measure the second premolar in its crypt, one may safely add 0.2 mm. to the value obtained for the first premolar and arrive at an acceptable figure for the second premolar.

When the mesiodistal widths of the deciduous and permanent teeth have been laid out on two separate lines, one may then compare the two totals. Open the dividers so that the points fall exactly into the two extreme holes pricked out on the line for deciduous teeth. This will give, with one divider setting, the total mesiodistal width of the three deciduous teeth under consideration. Transfer this distance to the third line on the card. Next, alter the divider setting so that the two points fall exactly into the extreme holes

pricked out on the card for the permanent tooth measurements. This will, as before, give the sum of the mesiodistal widths of these teeth. This distance is then transferred to the same third line. In almost every case the permanent mesiodistal width measurement will be less than the mesiodistal width indicated for the deciduous teeth. The distance between the two holes gives the difference between the mesiodistal widths of the deciduous teeth and their successors, and this difference I have called "leeway."

Having determined the size of the leeway on one side, one usually need only double the value to indicate the total amount of leeway which obtains in the case from the mesial of one first mandibular molar around to the mesial of the first molar of the opposite side. Very rarely do unilateral complicating factors oblige one to work out the leeway for each side in order to arrive at exactly the amount of space available. The size of this leeway determines materially the prognosis of the case.

Two other measurements of considerable importance should be taken from this mandibular model of the mixed dentition.

One of these is the perimeter of the arch from the mesiobuccal of one mandibular first permanent molar around to the mesiobuccal of the first molar of the opposite side. This is called simply the "outside" measurement. In order to determine this, take a piece of brass wire about 0.010 inch in diameter and curve one end of it slightly, using the arch-bending pliers, so that the end curves into the embrasure and touches the mesiobuccal surface of the mandibular first permanent molar, when the main portion of the wire is lying on the middle third of the buccal surface of the second deciduous molar. Holding the wire in this position with the end securely against the mesiobuccal of the first molar, adapt it so that it touches the middle third of the teeth around the arch until it may be adapted into the embrasure between the mandibular second deciduous molar and first permanent molar in the same manner as the wire entered the embrasure of the opposite side, touching the mesiobuccal surface of the first permanent molar. When the wire has been adapted in this manner, it is cut and readapted so that the cut end exactly touches the mesiobuccal surface of the first permanent molar as it did on the opposite side. The heavy line in Fig. 6 indicates the position of this wire when it is on the model. When the wire has been accurately adapted and cut off, it should be put in a coin envelope reserved for the purpose and labeled with the patient's name. It will then be available for future comparison of the length of the mixed dentition model, from molar to molar, with that of the permanent dentition model.

Another measurement is made with the dividers and has been called the "inside" measurement. It is made by placing one point of the dividers at the mesiolingual of the mandibular first permanent molar of one side at the point where the lingual tissues touch the crown of the tooth. The dividers are then opened until the other point rests upon the gingival tissues between the mandibular central incisors at their lingual aspect. This measurement may be transferred to the card reserved for the patient, on which the mesiodistal widths of the mandibular deciduous and permanent teeth have been laid out. This measurement is indicated in Fig. 6.

In order that there be no misunderstanding of the purposes of this paper, I will state what my observations have been concerning these measurements. I have found, as I shall illustrate with specific cases, that the outside measurement will not be increased from the time of the mixed dentition to the time when all of the permanent teeth are present. Instead, there will be a definite decrease upon the succession of the permanent teeth. Moreover, in addition to these observations concerning the transition from mixed to permanent dentition, certain definite statements may be made regarding the extent to which these measurements are affected by orthodontic treatment.

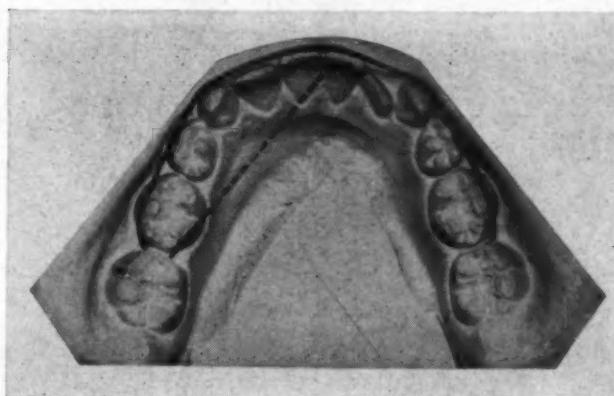


Fig. 6.—The solid line indicates the "outside" measurement referred to in the text. This is a measure of the amount of room available for teeth between the mandibular first permanent molars. Note that the wire spans the space between the deciduous canine and the permanent lateral on the right side; no effort is made to bring the wire into contact with the lingually displaced permanent lateral incisor. The dotted line is the "inside" measurement, obtained with an ordinary pair of dividers. (See text for complete description.)

It will be immediately realized that any orthodontic procedure intended to accommodate teeth in nonrotated positions is an effort to increase this outside measurement. I have found that this length cannot be permanently increased through mixed dentition treatment,* and that the shortening of this length observed in untreated cases is a natural and normal process and takes place in spite of treatment. In like manner, the inside measurement decreases. It should be understood that all comparisons cited are between the mandibular arch as it presents for mixed dentition treatment or observation and as it appears later when the permanent teeth have replaced the deciduous teeth. The transitional stage following mixed dentition treatment, when deciduous teeth are still present, need not concern us in a long-term analysis of any mouth.

SUCCESSFULLY TREATED MIXED DENTITION CASES

Having discussed in a general way some of the important considerations of tooth sizes in mixed dentition treatment, let us now consider some specifically treated cases.

The occlusion of the first case is shown in Fig. 7. Treatment of this Class II, Division 1 (distoclusion) case was started in 1924 when the boy was 10 years old. The last models were made in 1939, when the patient was 25

*Unless the mandibular arch has collapsed because of premature loss of deciduous teeth.

Fig. 7.



Fig. 8.

Fig. 7.—A Class II, Division 1 mixed dentition case with crowding in the mandibular arch, which was treated in 1924. Deciduous mandibular canines should have been removed as an aid in treatment. (See text.)

Fig. 8.—Permanent dentition of the case shown in Fig. 7, many years after all retaining devices were discarded.

years old. (Fig. 8.) Lateral views of the face taken at 10 and at 25 years may be seen in Fig. 9. It goes without saying that this patient has been without retainers of any sort since his early teens.

While I would handle this case in an entirely different manner now, in 1924 I treated it according to the generally accepted procedures of the day. These consisted of expanding to make room in the arch for the lingually placed mandibular right lateral, and treating the jaw relationship by means of intermaxillary elastics. The effect of the expansion was to put the teeth in "foreign territory," since the principal reason for the lack of room for the lateral incisors—evident upon taking these simple measurements—was excessive deciduous tooth material, and not inherent deficiency of basal bone. The combined width of the mandibular deciduous canine, first molar, and second molar was 4 mm. greater than the combined mesiodistal width of the three teeth succeeding them. This is the greatest leeway I have found in any case in my practice. Continued study of many similar cases makes it evident that the stability of the final result shown in Fig. 8, at the age of 25 years, is primarily due to this "favorable leeway," which was 8 mm. when both sides of the arch were considered. Today I would treat this case in a manner which would make less demand upon the tissues, but a detailed discussion of my present plan for treatment should be reserved for a later portion of this paper.



Fig. 9.—Profile photographs of the patient whose models are shown in Figs. 7 and 8. The more recent photograph shows the patient many years after retention was discontinued.

Another Class II, Division 1 case which was treated in the same manner and which has been followed over a long number of years is shown in Fig. 10. The resemblance between this case and the preceding one is marked. While the previous case showed more crowding in the mandibular anterior segment than does this one, this case presented a more marked labial tipping of the mandibular anterior teeth. The leeway amounted to 3 mm. on each side, or

Fig. 10.

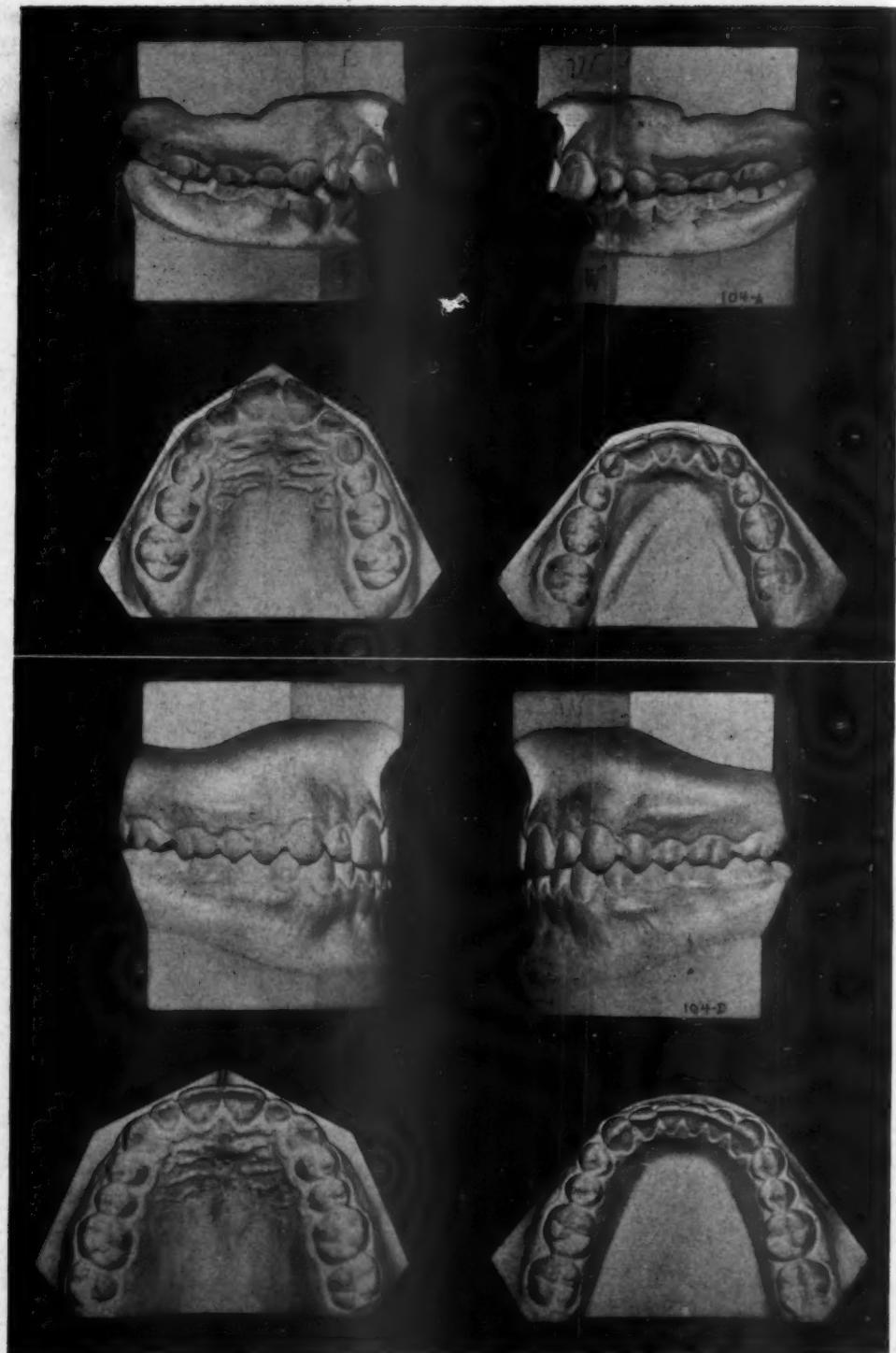


Fig. 11.

Fig. 10.—Another Class II, Division 1 case treated many years ago.
Fig. 11.—The adult dentition of the case shown in Fig. 10, many years out of retention. This case might well have waited until the permanent dentition for treatment.

a total of 6 mm. for the two sides. Models made many years after the case was released from all retaining devices show a satisfactory result (Fig. 11). Whereas in the previous case the leeway was so generous as to provide ample room for repositioning the crowded mandibular anteriors, in this case much of the 6 mm. favorable leeway was used in repositioning the mandibular anteriors to their normal axial inclinations over basal bone.

As satisfactory a result would undoubtedly have been obtained had all treatment been deferred until the permanent dentition period.



Fig. 12.—A late deciduous case with narrowing of alveolar process in the mandibular anterior segment.

The case shown in Fig. 12 was started in the deciduous dentition and was the first in which I deliberately removed deciduous canines for any treatment purpose. This was in February, 1934. My ideas concerning *not* making room for all deciduous teeth, as well as for the permanent ones present, in mixed dentition arches, took form with the treatment of this case. It will be noted that there was premature loss of a deciduous incisor, causing a narrowing of the alveolar process in that area. Treatment was begun in the late deciduous dentition and carried over into the mixed dentition. It became evident during treatment, in which general expansion was used, that mandibular incisors were being moved labially until their labial investing tissues were endangered. Accordingly, it was decided to remove the deciduous canines and to encroach upon the spaces which they had occupied, in order to avoid tissue damage. At that time, I was not conscious of the importance of relating teeth to basal bone, later brought out by Tweed. I was merely protecting tissues. Fig. 13 shows the correction that was obtained in the mixed dentition period. One will note that while there is a normal mesiodistal relationship of the deciduous second

Fig. 13.



Fig. 14.

Fig. 13.—After a period of mixed dentition treatment (time of retention), in which mandibular deciduous canines were removed to prevent further encroachment on labial investing tissues.

Fig. 14.—See Figs. 12 and 13. The same case after a period of treatment in the permanent dentition. Adequate bone was present from the start, with a leeway of 3 mm. on each side. There should have been no active treatment until the permanent dentition.

molars, there is an end-on relationship of the first permanent molars. The reason for this apparent discrepancy will be explained later in this paper.

If all treatment had been deferred until the permanent dentition, an ultimate result as satisfactory as that obtained by a lengthy period beginning in the deciduous dentition could have been achieved in a relatively short period of time. The result at the time of retention, obtained through unnecessarily long treatment, is shown in Fig. 14. The leeway amounted to 2.8 mm. on each side, which is favorable.

Fig. 15 shows a typical end-on occlusion of first permanent molars in the mixed dentition. This Class I case would be given a most unfavorable prognosis by the older standards of mixed dentition treatment, since there is barely room for the four permanent mandibular incisors; the space between the central incisors would be required for the accommodation of the lateral incisors in nonrotated positions. In spite of the virtual disappearance of the space once occupied by the deciduous mandibular canines, this case responded well to treatment and remained stable. This occlusion is shown in Fig. 16, six years after all retaining devices were discontinued. Only a slight break at the mandibular left central-lateral contact mars the integrity of the mandibular arch. A systematic analysis of the potentialities of this case was made from the models of the mixed and permanent dentitions. But it should be remembered that this could have been done at the outset, using x-rays to determine the widths of the permanent teeth.

Measurements show that there was considerable expansion in the premolar and molar areas during treatment, some of which was maintained after removal of retainers. This partially accounts for the more favorable result obtained than that prognosticated from the differential in tooth size, even though very little additional room for teeth is gained through buccal expansion.

Another factor marks this case as an unusual one. This is the fact that the sum of the mesiodistal widths of first and second deciduous molars of one side nearly equals the sum of the canine and two premolars of that side. This factor, plus the expansion, plus the fact that the deciduous canines were prematurely lost,* jointly made possible a nearly stable result without the removal of tooth structure.

The models shown in Figs. 17 and 18 may be cited as an example of an excellent sort of preventive service which may be rendered by the orthodontist. The ectopic eruption of mandibular permanent lateral incisors, causing exfoliation of deciduous canines, has always been deplored. When we consider this case in the light of those previously presented, we may legitimately ask whether or not such a loss is not a blessing in disguise. As may be seen, the crowding of the four permanent incisors into the space between the deciduous canines displaced the mandibular left central incisor labially into such an unfavorable position as to deprive it of labial investing tissue. Since the natural course of events did not remove the deciduous canines (as often happens), this removal of excessive tooth material should have been

*When deciduous canines are prematurely lost, mandibular incisors are seemingly positioned lingually by lip pressure, so that it is possible later to move them somewhat labially in treatment without relapse or tissue damage.

Fig. 15.



Fig. 16.

Fig. 15.—Typical mixed dentition case with end-on occlusion of first permanent molars. Note that there is barely room for the four mandibular permanent incisors in spite of the loss of the deciduous canines.

Fig. 16.—The case shown in Fig. 15, six years after all retaining devices had been discarded. (See text for detailed analysis.)



Fig. 17.



Fig. 18.



Fig. 19.

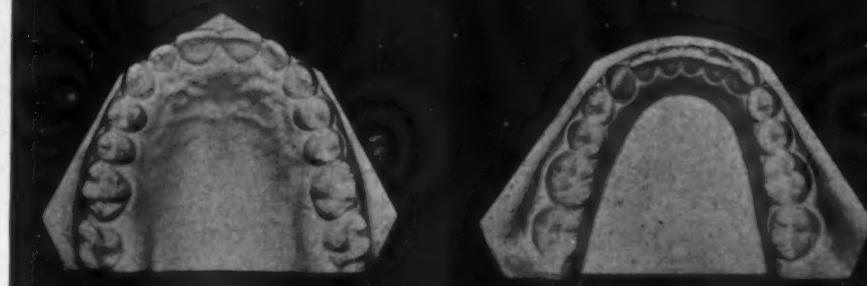


Fig. 17.—A mixed dentition case with crowding of the mandibular anterior segment. Permanent central incisors are displaced forward so that investing tissues are jeopardized. (See Fig. 18.)

Fig. 18.—The case shown in Fig. 17, before and after treatment. Note improvement in labial investing tissue.

Fig. 19.—The case shown in Figs. 17 and 18, years out of retention. Deciduous canines should have been removed when the case presented, and active treatment deferred until the permanent dentition.

deliberately performed. Instead of so doing, I subjected the child to a long period of treatment in which room was made for all the teeth. Consequently, I attribute the ultimate success of this case more to good fortune than to any skillful diagnosis and treatment planning. The occlusion shown in Fig. 19, four and one-half years after retainers were discarded, is better than that seen at the end of treatment. Not only are cuspal relations improved, but there is also material improvement in the soft tissues over the incisor tooth which was permitted to return to its normal position over basal bone. This same improvement could have been obtained, I now realize, simply by removing the mandibular deciduous canines and giving the case regular "hands-off" supervision until the end of the mixed dentition. If treatment were then indicated, it could have been accomplished in a relatively short period of time in the permanent dentition, thereby saving years of unnecessary treatment in the mixed dentition.

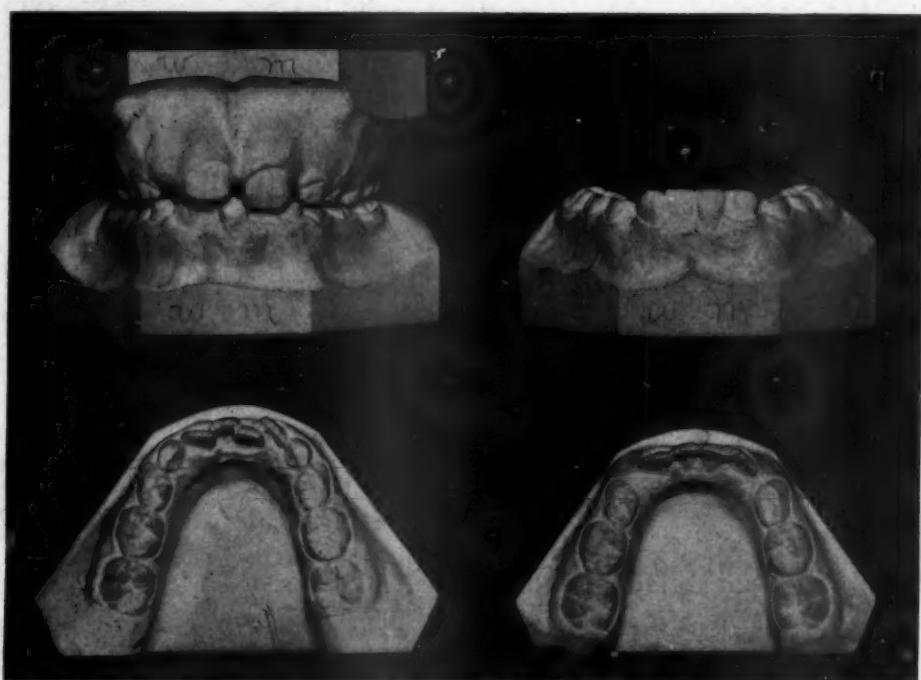


Fig. 20.—Showing how the same improvement in investing tissues as obtained in the previous case (Figs. 17 to 19) was reached by merely extracting mandibular deciduous canines. Otherwise, "hands off" until the permanent dentition.

A more recent case (Fig. 20) serves as an example of this minimal sort of guidance, in which as much was gained in the way of labial tissue improvement as in the previous case, simply by removing the mandibular deciduous canines. This improvement in labial investing tissues and the realignment of the incisors took place without orthodontic intervention in a period of seventeen months. The leeway in this case was exactly zero; remember that forward positioning of first molars takes place whether or not leeway is present. Actual treatment of this case should wait until the permanent dentition, when the four first premolars should be removed.

Fig. 21.



Fig. 22.

Fig. 21.—A mixed dentition Class I case with lack of room for mandibular incisors.

Fig. 22.—The case shown in Fig. 21, three years after all retaining devices were discarded. Measurements indicate that the stability of the final result was due to inherent potentialities.

A mixed dentition Class I case with marked crowding of the mandibular anterior segment is seen in Fig. 21. The central incisors are slightly forward and the lateral incisors are crowded lingually because of the lack of space between permanent central incisors and the deciduous canines. Although this case was treated actively by means of expansion, leading to a stable result several years out of retention, the stability may be attributed less to any particular mode of treatment than to inherent potentialities of the case. The secret of the successful outcome of this case, shown in Fig. 22, three years after retaining appliances were discarded, is that on each side of the mandibular arch there was a favorable leeway of 3 mm.

The outside, or wire measurement around the arch from molar to molar shows a shortening of 3 mm. between the initial mixed dentition models (Fig. 21) and the last models, three years out of retention (Fig. 22). In other words, sufficient arch length for all the permanent teeth was present when the case presented, with some to spare. My observations show that when this space is not initially present, the orthodontist can do nothing to remedy the situation with lasting effect, beyond gaining a slight amount in over-all arch length through buccal expansion. This case could have been treated satisfactorily, in a short period of time, in the early permanent dentition.

The cases cited so far could be matched by many others of similar types, but these will perhaps suffice as being representative of mixed dentition cases which have stood the test of time. All had active treatment, and they resemble one another in that (a) *years out of retention they show stable, balanced occlusions with healthy supporting tissues*, and (b) *every case shows a favorable leeway in tooth size between mandibular deciduous canines and molars and the permanent teeth which succeeded them*.

ACTIVE TREATMENT WITH ULTIMATE RELAPSE

We come now to a series of actively treated cases begun in the mixed dentition, none of which met with ultimate success, although each seemed quite acceptable at the time retaining appliances were removed. The girl whose models are shown in Fig. 23 presented for treatment with a malocclusion in the mixed dentition. In making the measurements to determine leeway, it was necessary to measure on each side the distance from the mesial of the mandibular first deciduous molar to the distal of the lateral incisor and to add those values to the mesiodistal widths of the mandibular deciduous molars. Comparison with permanent tooth sizes showed a leeway of only 0.5 mm.

The mandibular arch was treated with a lingual arch appliance and small auxiliary springs, with light pressure delivered gradually over a long period of time. The result, seen in Fig. 24, would pass in most orthodontic circles. Shortly after retainers were removed, however, the mandibular anterior segment became irregular, with the relapse particularly marked in the canine-lateral incisor region (Fig. 25).

Obviously, 0.5 mm. of leeway on each side, plus the slight expansion factor, furnished insufficient space for positioning mandibular permanent teeth in nonrotated positions over basal bone. Unaware, at the time, of the limitations

involved, I sought to exercise the frequently mentioned prerogative of the orthodontist, "stimulating," or at least working with facial growth. In so doing, I moved the mandibular incisors labially forward of their proper positions over basal bone, into positions in which they would not stay. Their return to more upright positions was inevitably accompanied by a disturbance of normal contact point relationships in the mandibular anterior segment.

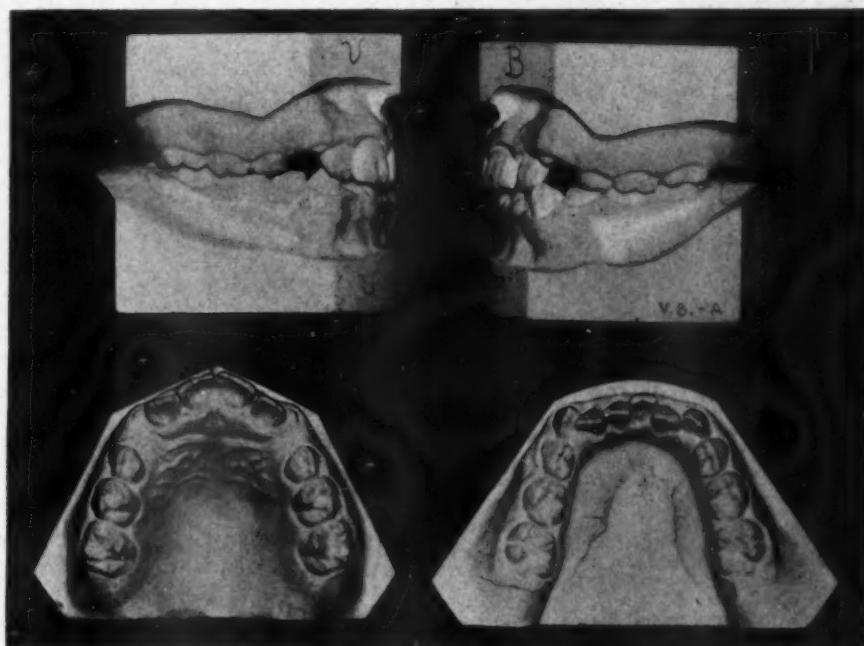


Fig. 23.—A Class I mixed dentition case with crowding in the mandibular anterior segment. The leeway in this case amounted to only 0.5 mm. on each side.

It is necessary to consider not only the magnitude of the leeway, but also what is required in the way of positioning the teeth to use up that leeway, and what changes in tooth positions are likely to occur to reduce that leeway further. All of this is excellently illustrated in the case of a girl first seen at 7 years of age (Fig. 26). Mandibular permanent lateral incisors were unerupted, with the permanent central incisors very well situated over basal bone. There was insufficient space between the mandibular deciduous canines for the four permanent incisors, and the deficiency was particularly marked on the right side. The leeway in this particular case amounted to 1.7 mm. on each side, the average value. I have yet to observe any mixed dentition case, which upon transition to the permanent dentition failed to shorten in its length from the mesiobuccal of one first permanent molar around to the same point on the opposite side.* Accordingly, the leeway of 1.7 mm. on each side should have been charged off to the mesial positioning of the first permanent molars, with no remainder left to provide space for the positioning of the incisors, which already had insufficient room in the arch.

*With the exception of cases which have sustained the premature loss of deciduous teeth, and occasional cases of Class II, Division 2, and perhaps Class I cases resembling them, where mandibular incisors have been tipped lingually and require uprighting.

Fig. 24.

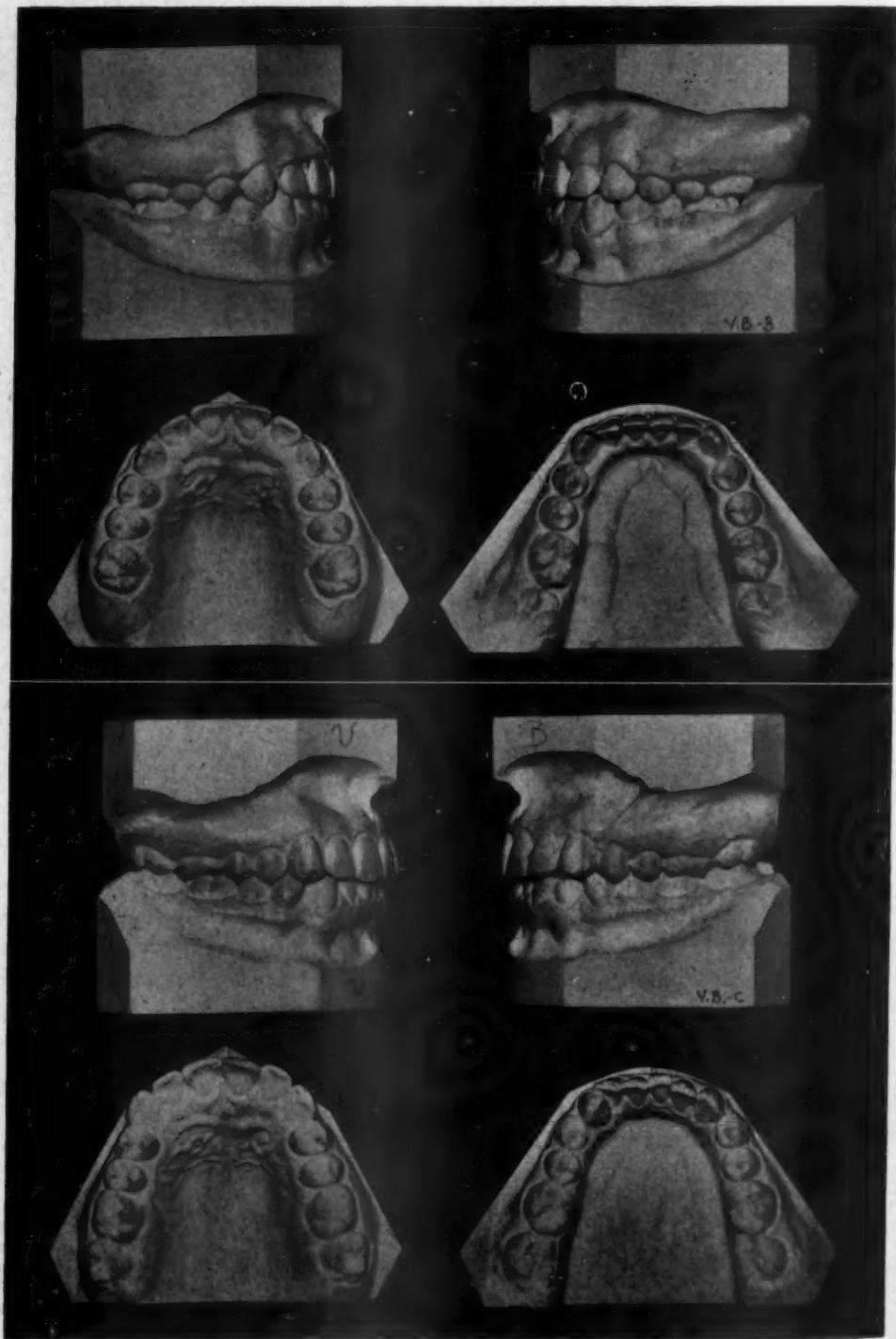


Fig. 25.

Fig. 24.—The case shown in Fig. 23, after treatment with a lingual arch and auxiliary springs with a light pressure delivered gradually over a long period of time.

Fig. 25.—The case shown in Figs. 23 and 24, eight years after retainers were discarded. Relapse began immediately after retainers were removed.

The le
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Fig. 26.



Fig. 27.

Fig. 26.—A Class I case which should never have been undertaken in the mixed dentition. The leeway in this case amounted to 1.7 mm. on each side.

Fig. 27.—The results of treatment by expansion obtained in the case shown in Fig. 26, at the end of the mixed dentition treatment period. Buccal segments were overexpanded, and mandibular incisors were moved forward.

Fig. 28.

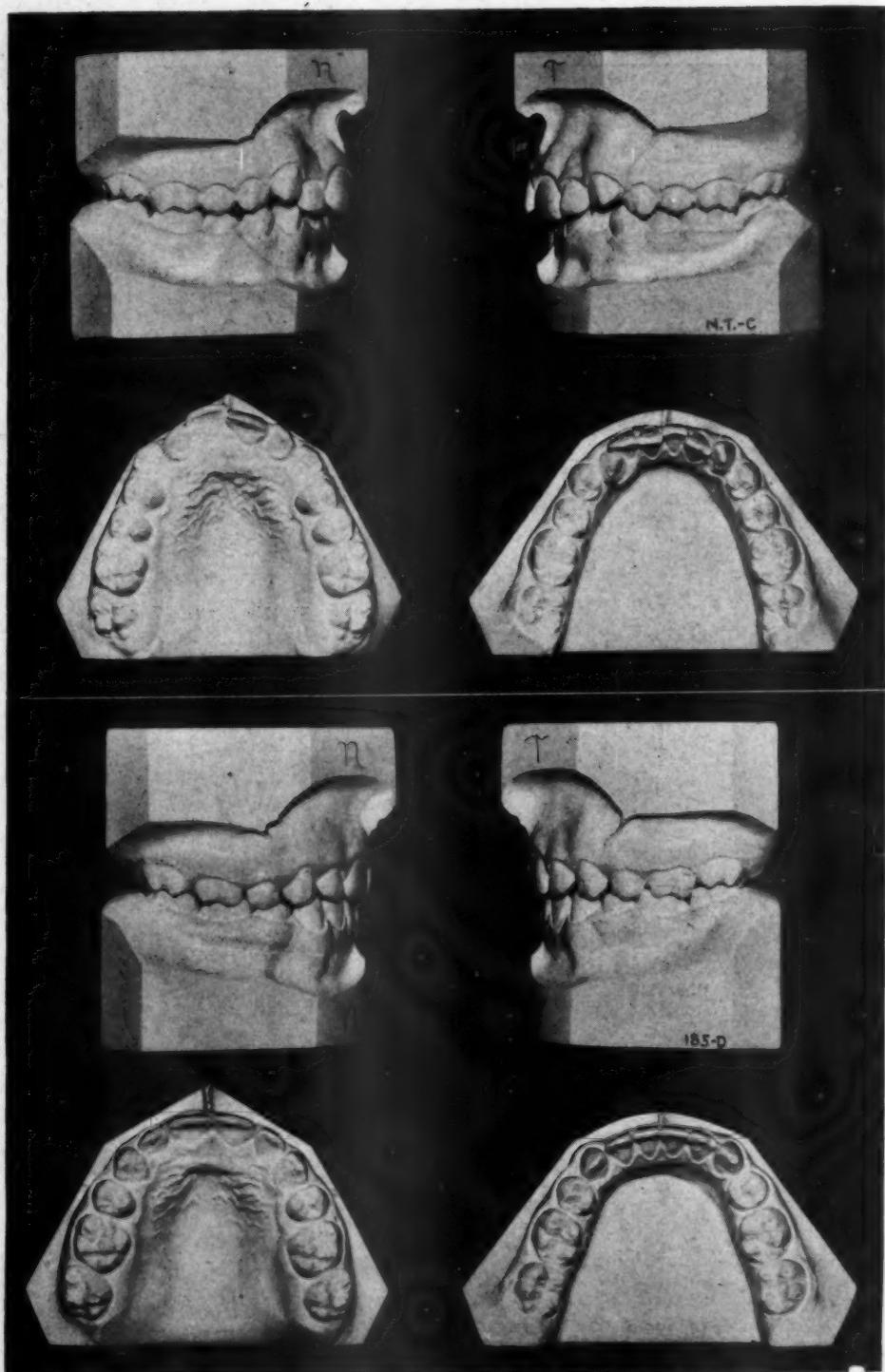


Fig. 29.

Fig. 28.—The same case shown in Figs. 26 and 27, after relapse. The potentialities for treating this case with a full complement of teeth were simply not present. The mixed dentition treatment should have been omitted.

Fig. 29.—The result of retreatment of the relapsed case of Fig. 28, after the extraction of four first premolars.

These things were not yet taken into account at the time the case was treated. The outside measurement in the models *taken at the end of treatment* shows an increase of about 4.7 mm. This was obtained only by considerable over-emphasis of buccal expansion and forward movement of mandibular incisors. (Fig. 27.)

This increase in arch length could not be maintained, as is indicated by the relapse (Fig. 28). The outside measurement described above was repeated on the models of the relapse, and found to be 3.3 mm. *less than that taken from the original models*, indicating that the shortening of this distance from the end of the mixed dentition treatment to the ultimate relapse exceeded 6 mm., and occurred after retainers were discarded.

The result of the second period of treatment in the above case, involving the extraction of the four first premolars, is shown in Fig. 29. Experience with this case and many others of the same type demonstrates that nothing can be gained by treating these cases in the mixed dentition when sufficient room between the first permanent molars is not available for the ten permanent teeth intended for that area, allowing for the inevitable mesial positioning of the first permanent molars.

CONSTRUCTION OF PREVENTIVE LINGUAL ARCH

The preventive lingual arch, mentioned so frequently in this paper, was used in Class I cases; that is, those not requiring the use of intermaxillary elastics, and it served no purpose other than to maintain the distance between the mandibular first permanent molars and incisors. It was a passive holding appliance, and was not used for moving teeth or for expansion.

The arch wire should be in contact with the lingual surfaces of the mandibular incisors at their gingival margins, and adapted in such manner that the eruption of the mandibular premolars will not be impeded, since these teeth are likely to erupt from a lingual position. If the arch is provided with half-round posts to fit lingual tubes on the molar bands, it will be readily removable for monthly inspection, and for prophylaxis of the lingual surfaces of the incisors.

One should not omit placing a band on one of the central incisors. The lingual surface of this band should carry a spur of 0.030 inch round gold wire, just long enough to lie upon the superior aspect of the lingual arch wire to prevent manipulation or displacement of it by the tongue. The application of this preventive arch technique to an earlier case has already been described (Fig. 1). Other instances in which this simple procedure alone was followed with permanently successful results will now be cited.

PREVENTIVE ARCH CASES—FAVORABLE OUTCOME

The case shown in Fig. 30 was seen for the first time at the age of 4 years. The maxillary deciduous central incisors and left lateral incisor were in lingual occlusion. This condition was corrected in a few weeks, giving the child a dentition normal for her age. No further orthodontic care beyond periodic observation was necessary until the eruption of the permanent incisors and

Fig. 30.



Fig. 31.

Fig. 30.—A deciduous malocclusion which responded favorably to a few weeks of treatment. This case was followed through the mixed dentition period into the permanent dentition, but only with a preventive lingual arch. There was no active treatment after the deciduous dentition. (See following figures.)

Fig. 31.—The case shown in Fig. 30, after the eruption of permanent incisors and first molars. A preventive lingual arch was placed at this time.

Fig. 32.

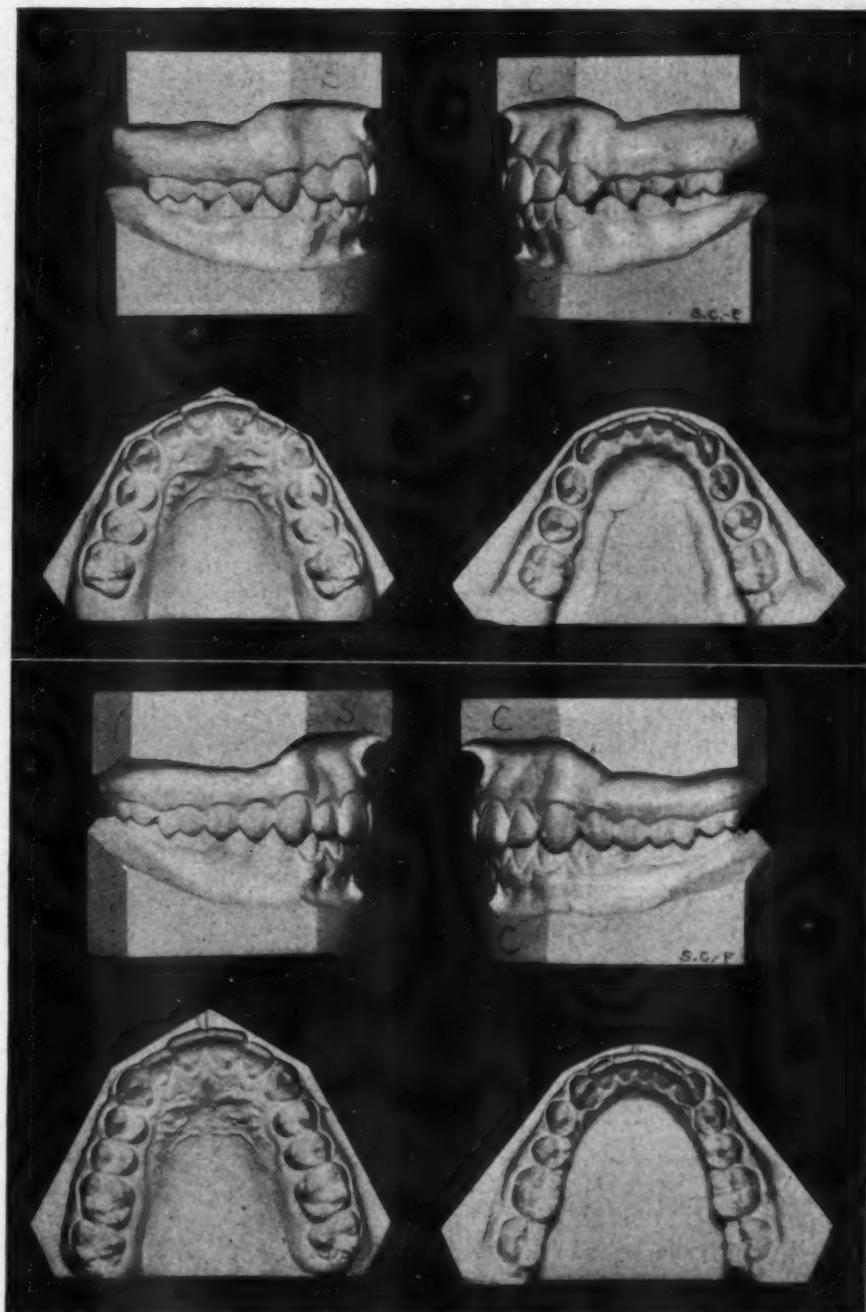


Fig. 33.

Fig. 32.—The case shown in Figs. 30 and 31, after the deciduous teeth were replaced by permanent teeth. Note the spaces which remain as a result of holding the distance between mandibular incisors and first molars by means of the lingual arch; note also the self-alignment of mandibular incisors.

Fig. 33.—Permanent dentition models of the case shown in Figs. 30 to 32, several years after removal of lingual arch. The case is esthetically and functionally satisfactory.

first molars (Fig. 31). At this time, a preventive lingual arch was placed in the mandibular arch to maintain the distance between the permanent molars and incisors, and the remaining mandibular deciduous canine was removed.

Fig. 32 shows the spaces between the first molars, premolars, and canines as a result of holding this distance. A comparison of measurements made with the wire applied to the buccal and labial surfaces of the teeth shows that the distance from the distal of the mandibular second deciduous molar to the same point on the opposite side, taken prior to the eruption of any permanent teeth, *exactly equaled* the distance from the mesial of the first permanent molar around the arch to the same point on the opposite side in the models taken upon removal of the preventive arch. When the case had been without appliances of any kind



Fig. 34.—A nonorthodontic normal occlusion of a woman in her thirties. The mandibular incisors, canines, and premolars of this patient could be accommodated in the space occupied by the mandibular deciduous arch of Fig. 30, with space left over.

for four years, the models shown in Fig. 33 were made. The spaces have closed and the teeth have remained in alignment with a good esthetic and functional result. This was due entirely to the fact that there was an extremely favorable leeway, 3.5 mm. on each side, which permitted any necessary self-correction of rotations of anterior permanent teeth, and allowed the forward positioning of the mandibular first permanent molars, which always occurs when deciduous molars are shed and replaced by premolars. The outside measurement is considerably shorter than that taken when only deciduous mandibular teeth were present, as measured from the distal of the deciduous second molars.

A comparison of the outside wire measurement taken from the deciduous arch (Fig. 30) with that taken on the model of a nonorthodontic normal, a

Fig. 35.

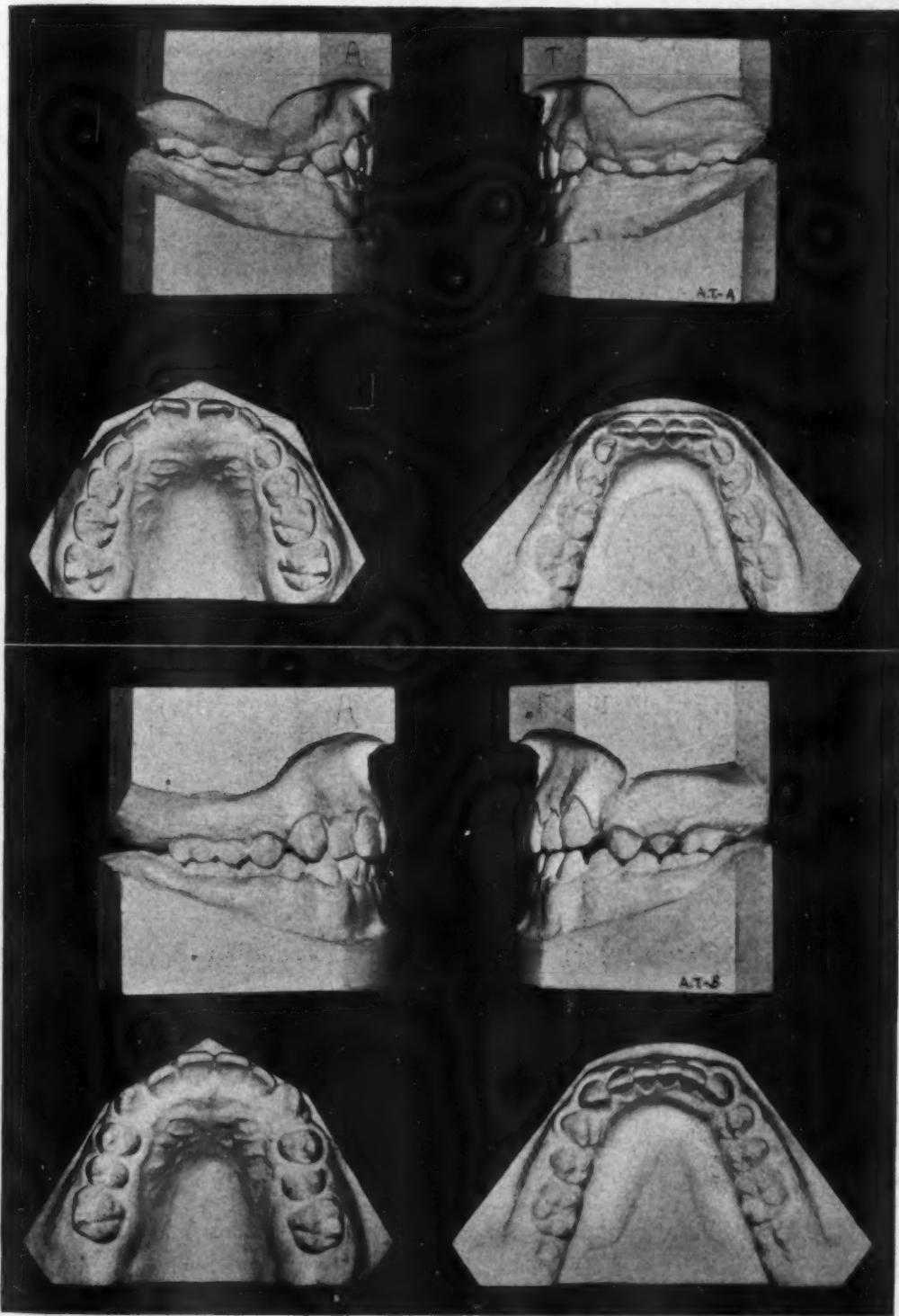


Fig. 36.

Fig. 35.—Another case which required only a preventive lingual arch. Note the relationship of the first permanent molars, which is not typical of the mixed dentition.

Fig. 36.—The case shown in Fig. 35, in the early permanent dentition. There is adequate room for the correction of the rotation of the mandibular left canine.

woman in her thirties (Fig. 34), indicates that the distance is less in the adult than in the 4-year-old child. This is true in spite of the fact that this adult's teeth are slightly larger than this child's permanent teeth. In other words, the mandibular premolars, canines, and incisors of any adult can be accommodated in the same area occupied by his or her mandibular deciduous teeth, with room left over; and the more favorable the leeway the more room there will be left over.

Fig. 35 shows another case which has had only preventive arch therapy. It illustrates how the occlusion of the first permanent molars must be taken into consideration in evaluating available leeway. Although there is only 1.7 mm. of leeway on each side of this boy's mandibular arch, the prognosis is nonetheless favorable. This is due to the fact that the first permanent molars are in the normal adult relationship of mesiobuccal cusp of the maxillary molar in the buccal groove of the mandibular first molar. Clinical observation has shown that in a situation such as this, one can expect less mesial positioning (shifting) of the mandibular first molars. Had these molars been in the end-on relationship usually seen in the mixed dentition, one might well have expected enough mesial migration of the mandibular first molars to use the entire leeway of 1.7 mm.

In a sense, the models shown in Fig. 36 represent an incomplete record, since the maxillary canines are not yet fully erupted. There is plenty of room for these teeth, however, and one has every right to expect that the maxillary arch will be very well aligned upon their full eruption. In the mandibular arch, the left canine shows a rotation. There is some space to the distal, however, into which this tooth might be rotated, and, if in the second period of treatment this space should prove insufficient for performing this rotation, the lingual axial inclinations of the mandibular incisors will permit labial tipping of these teeth to a degree sufficient to accommodate the canine in a non-rotated position. Although the models shown in Fig. 36 represent the condition of the mouth at the boy's last appointment some years ago, it is entirely safe to say that the only defect remaining is the rotation of the mandibular left canine.

PREVENTIVE ARCH CASES WITH UNSUCCESSFUL OUTCOME

Fig. 37 introduces a new group of cases, those in which only preventive measures were undertaken, with lack of success. At the same time, it illustrates an important aspect of using tooth measurements in mixed dentition diagnosis.

A lingual arch was placed in the mandibular arch for the sole purpose of maintaining arch length between permanent incisors and first molars. No attempt at expansion was undertaken. Fig. 38 shows the occlusion which obtained upon the eruption of permanent mandibular canines and premolars. The futility of orthodontic preventive measures in this particular case in the mixed dentition is evident from proper evaluation of measurements which could have been taken when the case presented.

The leeway was 1.7 mm. on each side, or average. This, however, considers teeth alone; that is, the sum of the deciduous canines and first and second

Fig. 37.

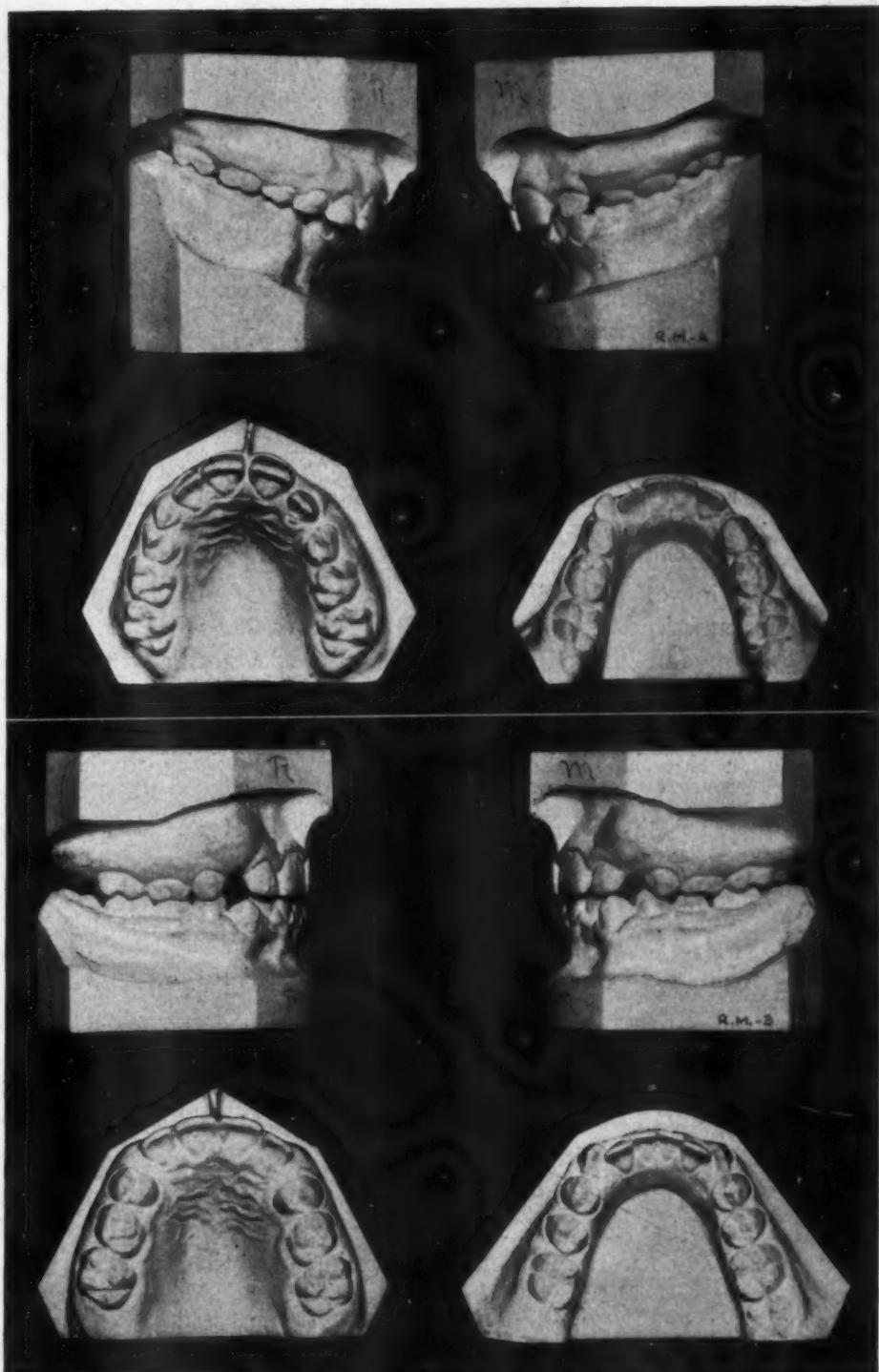


Fig. 38.

Fig. 37.—A preventive lingual arch was used in this case, with an unsuccessful result. A proper analysis of this case in the beginning would have shown the futility of placing such an arch.

Fig. 38.—The inevitable outcome of the case shown in Fig. 37. Potentialities for accommodating all of the teeth between mandibular first permanent molars were never present.

molars on one side exceeded the sum of the mesiodistal widths of the permanent teeth which succeeded them by 1.7 mm. The widths of the deciduous teeth are important, however, only when they occupy their full space in the arch. What we are really interested in is the space available for positioning teeth, around the arch from mesial of mandibular first permanent molar of one side to the mesial of the first molar of the opposite side. In this case, therefore, we must measure not the deciduous canines, but the space between the mesial of the deciduous first molar and the distal of the permanent lateral incisor. The right deciduous canine was missing and the space was partially closed; the left was present, but in a labial position, and the space for it amounted to less than its mesiodistal width. When the size of these spaces is added to the mesiodistal widths of mandibular first and second deciduous molars and the total is compared with the sum of the permanent canine and premolars, it must be realized that preventive arch therapy could only be rewarded with a result like that shown in Fig. 38. There was simply not enough room for four premolars, two canines, and four incisors between the mesial surfaces of the mandibular first molars, and this did not take into account forward positioning of first molars. Because the outside measurement cannot in any manner now known to orthodontists be increased with permanence beyond the slight amount gained through buccal expansion, this case has already been successfully treated, following extraction of the four first premolars.

An unusual condition was presented in the diagnosis of the case shown in Fig. 39. The sum of the mesiodistal widths of the remaining deciduous teeth (canines and molars) *exactly equaled* that of the permanent teeth which succeeded them. Since there was crowding in the mandibular anterior segment in the mixed dentition, and no leeway existed for the exchange of deciduous for permanent teeth, preventive arch therapy was pointless in every respect. An accurate evaluation of the preliminary records (models and full-mouth x-rays), taken at the beginning of treatment, would have indicated that treatment should have been deferred until the permanent dentition and also that the four first premolars should be removed, to bring tooth material within the capacity of the jaws for supporting the teeth in stable alignment and occlusion. In other words, the occlusion seen in Fig. 40 might have been closely predicted within a few minutes after the models and x-rays had been placed before the orthodontist when the case first presented for diagnosis and treatment.

Still another preventive arch case with an unfavorable outcome is shown in the mixed dentition in Fig. 41. The mandibular permanent lateral incisors may be seen to have erupted without the exfoliation of the mandibular deciduous lateral incisors. There was clearly insufficient room for the permanent lateral incisors between the permanent central incisors and the deciduous canines. Measurements of the permanent canines and premolars would have revealed, had they been compared with the mesiodistal widths of the deciduous teeth, that there was insufficient leeway (1.0 mm. each side) to accommodate the lingually placed lateral incisors in their normal situation. An evaluation of this sort was not attempted, however, at the time, many years ago, when this case was taken under supervision. Instead, a preventive lingual arch

Fig. 39.



Fig. 40.

Fig. 39.—A mixed dentition malocclusion in which there was no leeway at all; although a preventive lingual arch was used, such procedure was not indicated.

Fig. 40.—Early permanent dentition models of the case shown in Fig. 39; this malocclusion might have been predicted from measurements made when the case first presented.

Fig. 41.



Fig. 42.

Fig. 41.—This mixed dentition case has not the potentialities for normal occlusion with a full complement of permanent teeth; this fact was not determined when the case presented, and a preventive arch was placed.

Fig. 42.—Showing the irregularities which remained in the mandibular arch after the eruption of permanent teeth. The use of a preventive arch was pointless in this case.

was placed and allowed to remain until the permanent teeth had erupted. Fig. 42 shows, with its irregularities in the mandibular anterior segment, the amount by which the mandibular basal bone failed to accommodate the full complement of permanent teeth. No treatment of any sort should have been attempted in this case until the denture had attained the developmental age indicated in Fig. 42, at which time the four first premolars should have been extracted.

MISCELLANEOUS MIXED DENTITION CASES

A case in which treatment definitely should have been deferred until permanent teeth had replaced all deciduous ones is shown in the mixed dentition in Fig. 43.* This case was treated in the mixed dentition to correct mesiodistal arch relationships and to place all teeth in nonrotated positions in the arch, following the older concepts of orthodontic treatment.

Fig. 44 shows the case some years later, and demonstrates the futility of the mixed dentition treatment. Nothing is seen here which could not have been accomplished without mixed dentition treatment, since the favorable leeway, 3.6 mm. on each side, made integrity of the arches a foregone conclusion. The treatment of a distocclusion case such as this is a simple matter in the permanent dentition, and can be brought to a satisfactory conclusion in a relatively short time. Fig. 45 shows the occlusion after twelve months of treatment. The case was completed too recently to show models out of retention, but in its present status it serves as an example of the opposite of "too little and too late": too much treatment, too soon undertaken.

An excellent opportunity for rendering preventive care is illustrated in Fig. 46. Dr. C. W. Carey of Palo Alto, California, was the first to see this case, and it was he who made the original models. When the patient moved to Southern California, the case was transferred to Dr. Howard Lang of Pasadena, who in turn referred the child to me for observation, upon his leaving this city for another location. Both of these men deserve a great deal of credit for performing a genuine preventive service.

As may be seen in Fig. 46, the maxillary right permanent central incisor and deciduous first and second molars and canine were in lingual relation to their proper mandibular antagonists, so that the mandibular right central incisor was held in a labial position which endangered its investing tissues.

A relatively short period of active treatment by Dr. Carey corrected the condition mentioned in the previous paragraph (Fig. 47). The patient then wore removable retainers for a time; no further treatment was required.

Although the final result is excellent, I offer a minor criticism of this treatment, because a slightly different plan of treatment would have given the same result with less effort and no overexpansion. Had the deciduous mandibular canines been removed at the beginning of treatment, the proper repositioning of the incisors over basal bone and the correction of the relationship between the maxillary and mandibular right central incisors would have been facilitated. The extremely favorable leeway in this case, which amounted to

*Strictly speaking, a preventive lingual arch would be placed at the end of the mixed dentition, for reasons to be explained later.

Fig. 43.

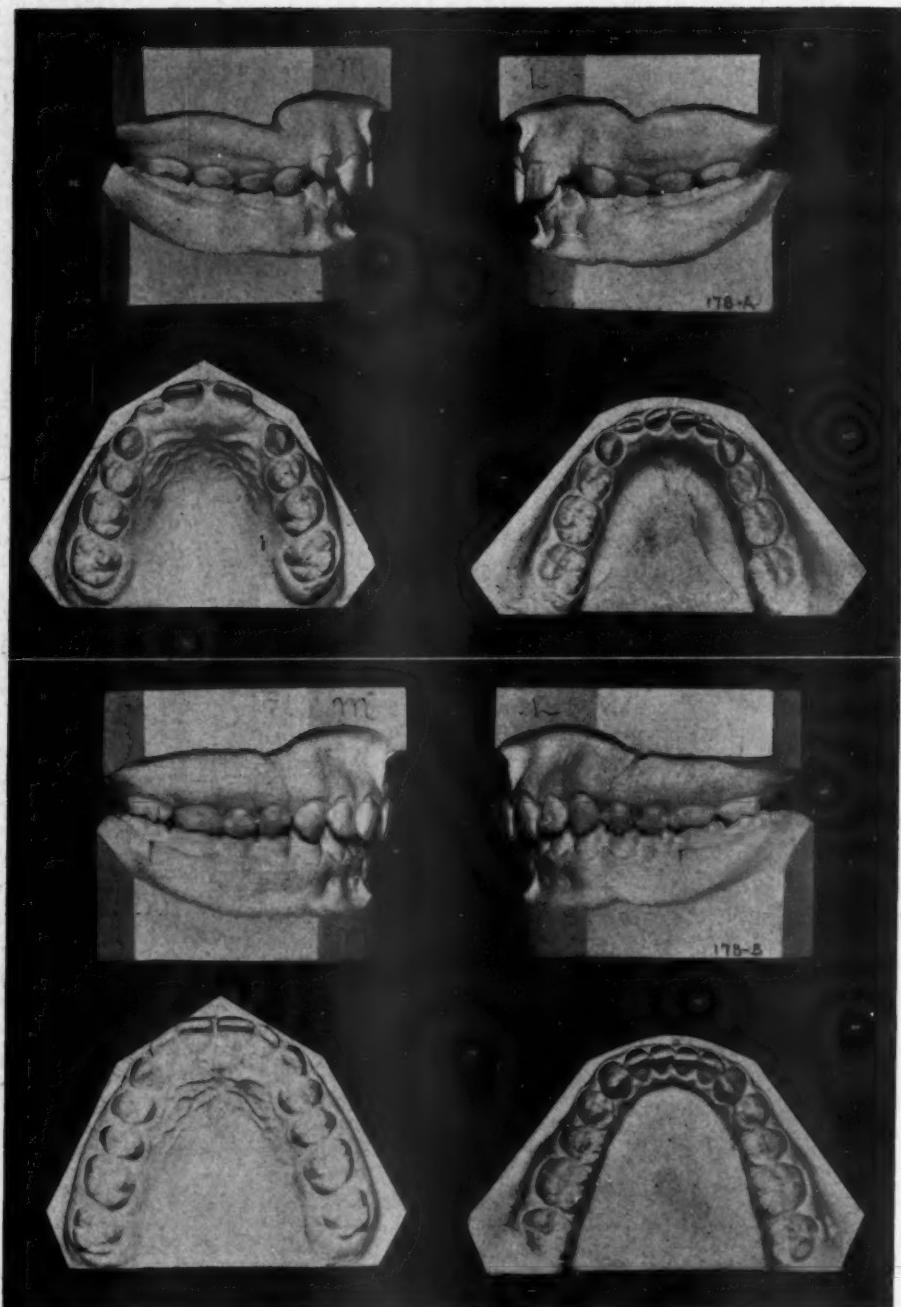


Fig. 44.

Fig. 43.—A mixed dentition case which had from the beginning the necessary potentialities for normal occlusion in the permanent dentition. Mixed dentition treatment was undertaken, although it is evident now that none was advisable.

Fig. 44.—The case shown in Fig. 43, after permanent teeth replaced deciduous ones. Instead of active treatment in the mixed dentition, the placing of a preventive lingual arch was indicated to prevent forward tipping of first permanent molars. Active treatment should have begun at the stage shown here.

slightly more than 3 mm. on each side, would have permitted the encroachment on a portion of the deciduous canine spaces, and the overexpansion would have been unnecessary. The permanent dentition is shown in Fig. 48.

The next case is presented for the sole purpose of illustrating the extent of utter confusion which exists in some orthodontists' minds with respect to diagnosis and case analysis of mixed dentition problems. Fig. 49 shows an extremely early phase of the mixed dentition period, with the first permanent molars as yet unerupted, the only permanent teeth in the mouth being the mandibular central incisors and the maxillary right central incisor. The case analysis advocated in this paper was carried out, using the study models shown in Fig. 49 and a set of intraoral x-rays. A favorable leeway of 2.8 mm. was found on

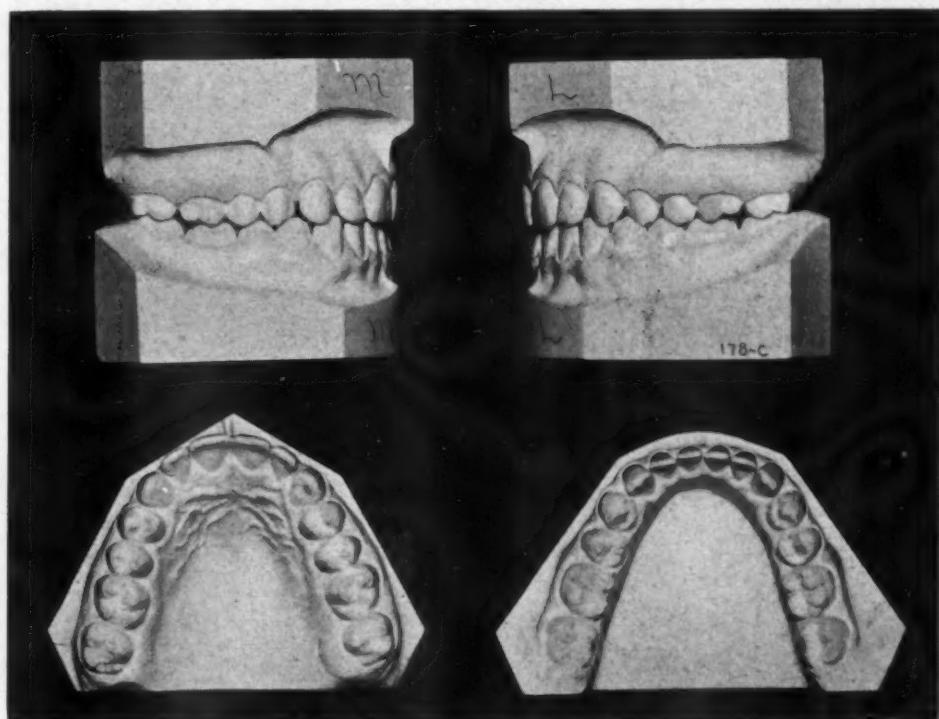


Fig. 45.—The case (see Figs. 43 and 44) at the time of retention, following a second period of treatment.

each side, with a total of 5.6 mm. Considering the case without measurements, no particular problem presents; there is a space between the mandibular permanent central incisors; and, seemingly, there is space enough for the mandibular lateral incisors when they erupt. The measurements make prospects even better. How could a child have a more favorable prognosis at this stage for accommodating all the permanent teeth than this one?

I present this mixed dentition because one week prior to the time the parent brought this child to my office, she was told by another orthodontist that a minimum of two years of treatment would be required immediately, and that after all of the permanent teeth had erupted, an indeterminate period of treatment would again have to be undertaken. It is my feeling that ortho-

Fig. 46.

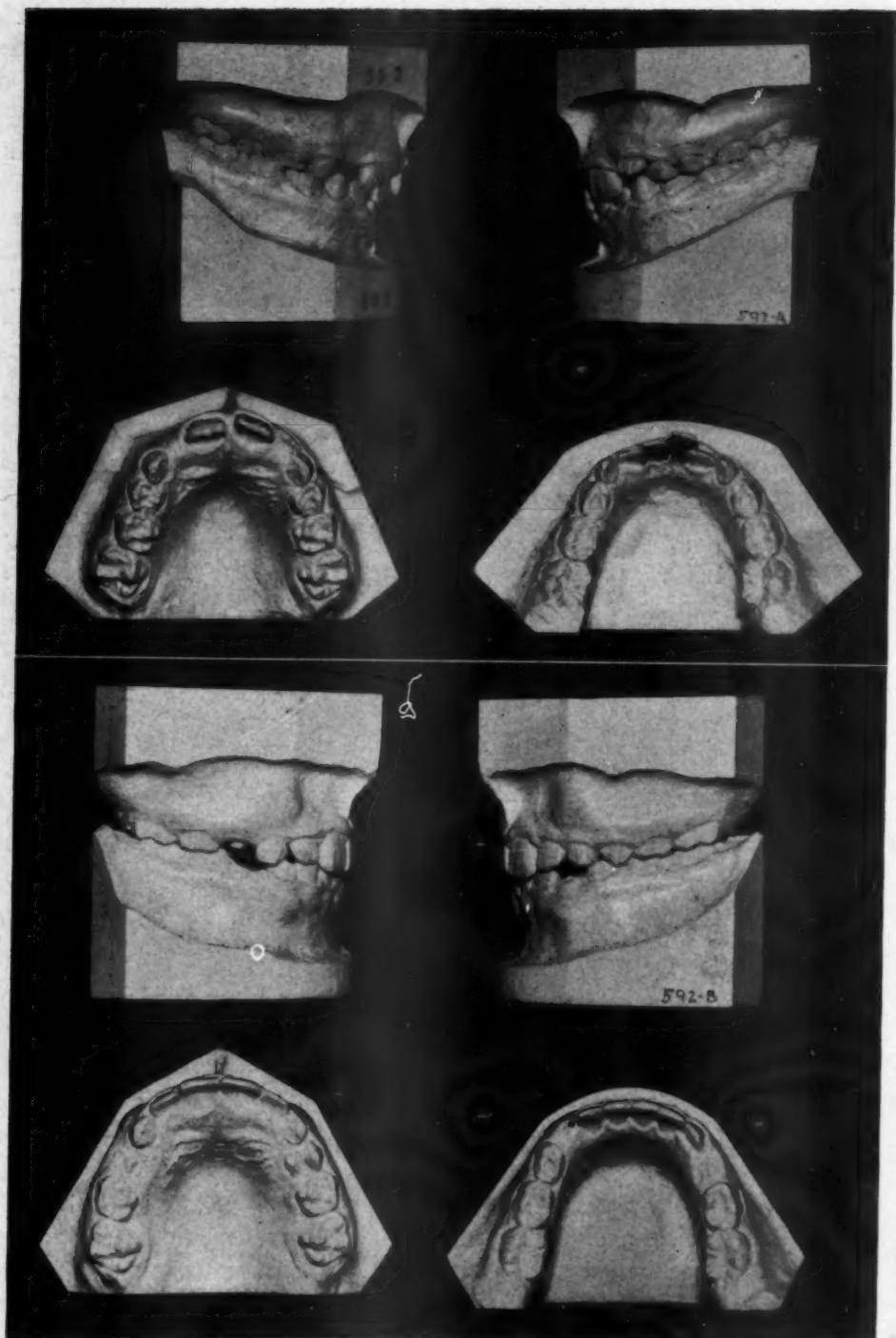


Fig. 47.

Fig. 46.—An early mixed dentition case requiring removal of deciduous canines and correction of the anterior and posterior crossbites. (See text.)

Fig. 47.—The results of active treatment of both maxillary and mandibular arches. No expansion of the mandibular arch was advisable. (See text.)

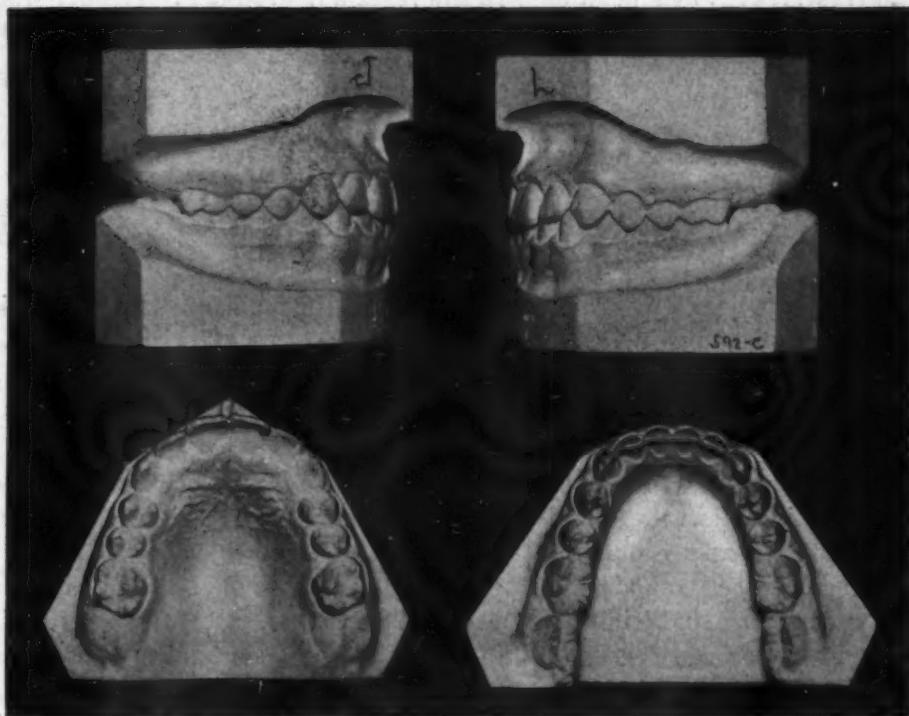


Fig. 48.—Permanent dentition of the case shown in Figs. 46 and 47.



Fig. 49.—One orthodontist recommended a lengthy period of treatment in the mixed dentition for this case, to be followed by a second period of treatment in the permanent dentition. (See text for analysis of potentialities.)

dontic treatment is beneficial only in the results it produces. The orthodontist who gave the advice just cited apparently feels that there is some mysterious benefit to be derived from orthodontic treatment per se, whether or not the need for it exists.

INDICATIONS FOR ACTIVE TREATMENT OF MIXED DENTITION CASES

In the preceding pages, I have stated my belief that active treatment of mixed dentition cases has been greatly overdone. On the other hand, I am far from advocating the complete abandonment of mixed dentition treatment. There are very clear indications for the prompt institution of treatment in the mixed dentition, the principal ones of which are: Class III malocclusions, cross-bites (anterior or posterior), and some Class II, Division 1 malocclusions, particularly those that detract greatly from the facial appearance of the patient.

On the other hand, it should be remembered that the great majority of cases which present to the orthodontist are Class I malocclusions, and the evidence which I have at hand convinces me that little can be done when the case fails to "measure out." If there is not a favorable leeway in the mandibular arch to accommodate all permanent teeth in nonrotated positions, and to allow for mesial positioning of the first permanent molars, then nothing of permanent value can be done; the slight amount that might be gained by expansion is useless. If the case analysis based on measurements does not indicate a favorable prognosis, then nothing should be done until the case is out of the mixed dentition stage, save in the exceptions cited. If the measurements, on the other hand, indicate that the prognosis is favorable, a possible preventive procedure, to be discussed later, may be undertaken.

CLASS II, DIVISION 1, MIXED DENTITION CASES

Since the characteristic facial appearance which accompanies Class II, Division 1 malocclusion frequently demands improvement, I have worked out a plan of treatment for such cases in the mixed dentition stage that avoids over-expansion and that does not put teeth in foreign territory. This involves the premature removal of the mandibular deciduous canines and the alignment of the four permanent incisors over basal bone, utilizing a portion of the canine spaces. This is accomplished through the use of a full edgewise appliance on the mandibular incisors, first and second deciduous molars, and first permanent molars. Closing loops are incorporated in the arch wire at the former situation of the canines. These loops are activated by means of spurs mesial to the molar tubes, with very slight activation at each appointment. By this method the incisors are positioned over basal bone with good axial inclinations. When this positioning of the mandibular incisors with normal axial inclinations has been accomplished, the loop appliance is replaced with a straight arch and anchorage preparation is undertaken. This makes possible the correction of the mesiodistal relationship in the conventional manner, using a full edgewise arch appliance in the maxillary arch also, with tip-back bends and Class II elastic ligatures.

I gave a table clinic showing this plan of treatment before the American Association of Orthodontists in Chicago in April, 1937, and subsequently pre-

sented it before the Southern Section of the Pacific Coast Society of Orthodontists on September 10, 1937, and again before the American Association of Orthodontists in Los Angeles in 1938.

A valuable addition to this treatment plan was suggested by Dr. Charles H. Tweed of Tucson, Arizona, upon the occasion of a visit to my office in 1937. We both realized that in using closing loops to position mandibular anterior teeth over basal bone, we ran the risk of causing forward movement of mandibular molars. Upon returning to his office, he began treatment of a number of cases, utilizing the principles outlined above, but adding Class III elastic ligatures to guard against mesial movement of the mandibular first permanent molars. This precaution is a wise one, and much credit is due Dr. Tweed for suggesting this adjunct to my plan of treatment.

Since 1937, I have used this method of treating Class II, Division 1 cases with gratifying results. I no longer use Class III elastic ligatures, however, but prefer occipital anchorage to the mandibular anterior segment, thereby avoiding any tendency to displace the maxillary arch forward.

INDICATIONS FOR USE OF THE PREVENTIVE LINGUAL ARCH

The frequent use of the preventive lingual arch, earlier described, was introduced into my practice in the belief that this simple device, making no demands upon the tissues, would do much to prevent malocclusion in later years. Unfortunately, the measurements which I have reported here as establishing definitely the marked limitations of active treatment also show that the same limitations apply to preventive measures. In other words, whether or not a child is to have a balanced, normal occlusion depends largely upon inherent potentials, and there seems to be little that the orthodontist can do to affect these potentials for the better.

In the event that there is insufficient room for premolars, canines, and incisors, plus about 1.7 mm. on each side for eventual forward positioning of the first permanent molars, there is nothing to be gained by attempting to hold this deficient arch length until permanent teeth have replaced all deciduous teeth. On the other hand, if the above requirements are met, then this favorable situation will be maintained by the deciduous teeth themselves, so long as sufficient root structure of the mandibular second deciduous molars remains to restrain first permanent molars. Clinical observations have shown that when these teeth are retained sufficiently long, with adequate roots, they provide an effective barrier to mesial migration of first permanent molars, even in the absence of first deciduous molars.

Since it is true that there is no point in holding arch length which is *not* sufficient to accommodate the normal number of teeth when that case will require extraction and active treatment in the permanent dentition stage, and since a case presenting with adequate arch length is capable of maintaining that length, the place of the preventive lingual arch is limited in present-day orthodontics to one situation wherein it is "good insurance."

This situation is that in which an analysis such as described above has been carried out, with the result that the orthodontist can be certain that there

is sufficient room for the teeth between the mesial surfaces of the two mandibular first permanent molars, as measured around the arch. If there are rotations or other irregularities present in the mandibular permanent incisors, and measurements have shown that eventually the leeway would account for the necessary arch length to correct these irregularities, always allowing for mesial positioning of first permanent molars, then it is wise to observe the case closely until the roots of the mandibular second deciduous molars are nearly gone, or until canines or first premolars need space. At this time, one should construct a preventive lingual arch and order the extraction of the mandibular deciduous second molars, placing the archwire to hold arch length. It should be realized, particularly where first permanent molars are in end-on occlusion, that some mesial positioning of these molars must be expected. It is not desirable, however, that this migration, in the form of forward crown tipping, exceed the amount necessary to bring the first permanent molars into their normal relationships. It is possible, on the other hand, that the first molars might migrate to the normal extent and then tip in their crown portions beyond that point, if precautions were not taken to hold them back. If the lingual arch is left in place until all of the premolars and canines have taken their places in the arch, and if sufficient leeway is present, spaces will be distributed between the teeth. At this time, it is hoped that rotations will have corrected themselves, when the lingual arch may be discarded and the first molars permitted to position themselves forward to their normal situations. If self-correction does not occur, any necessary treatment is simplified by the prevention of excessive forward tipping of first molars.

DISCUSSION

Although this paper has been limited largely to considerations of the mandibular dental arch in the mixed dentition and its transition to the permanent dentition, some brief mention should be made of the maxillary arch in this age range. In Table I the relative mesiodistal widths of mandibular canines and first and second deciduous molars were compared with the mesiodistal widths of the permanent canines and the first and second premolars, and it was shown that in the average case a leeway of 1.7 mm. exists, with the deciduous teeth being the larger. It happens that this difference between the total mesiodistal widths of the corresponding three deciduous teeth in the maxillary arch as compared with the three permanent teeth which succeed them is only 0.9 mm. This difference is not only interesting, but of considerable clinical importance.

It is a fact that the mixed dentition is characterized by an end-on relationship of the maxillary and mandibular first permanent molars, instead of the typical cusp-in-groove relationship of the normal permanent dentition. This end-on relationship of the first permanent molars, where second deciduous molars have a normal mesiodistal relationship, may be explained on the basis of this difference in leeway between the mandibular and maxillary arches.

It has previously been said that my measurements show that mandibular first permanent molars always come forward in transition from the mixed to

the permanent dentition. This same forward positioning also takes place in the maxillary arch at the corresponding time. The first permanent molars may be thought of as occupying temporary positions, at which they arrive because they must erupt distally to the deciduous molars, which are larger mesiodistally than the premolars ultimately intended for that space. The pronounced difference in leeway between the maxillary and mandibular arches accounts for the end-on relationship observed in the first permanent molars of the mixed dentition; the mandibular first permanent molars are obliged to erupt distally, on the average, by 1.7 mm. The maxillary first permanent molars are also held distally to their eventual normal positions, but only by 0.9 mm. As a consequence, an end-on relationship of these first permanent molars obtains only during the mixed dentition period, and this temporary relationship is changed upon the succession of permanent teeth to the arches. Maxillary first permanent molars come forward, on the average, 0.9 mm., but mandibular first permanent molars come forward approximately 1.7 mm. This greater distance traveled in the mesial positioning of the mandibular first permanent molars accounts for the change from an end-on relationship to a cusp-in-groove relationship seen in the normal permanent dentition. My measurements indicate that when mixed dentition cases present a normal mesiodistal relationship of both the second deciduous molars and first permanent molars, maxillary deciduous molars are larger than average, with an amount of forward positioning occurring that is comparable with that of the mandibular arch.

The clinical importance of this difference in leeway between upper and lower arches lies in the dilemma which is presented in mixed dentition treatment when one seeks to leave the finished case in a balanced relationship at the end of treatment. If one finishes the case with the incisors and canines in proper relationship, the first permanent molars will remain end-on. Anyone who fails to take into account this difference in the leeway of mandibular and maxillary arches will be inclined to think the case has "Class II tendencies." If, on the other hand, one seeks to establish a Class I relationship of the first permanent molars, he will frequently establish an edge-to-edge relationship of the incisors or even simulate a Class III relationship. It will be readily realized that the removal of the deciduous canines and the utilization of some of the space in the repositioning of the incisors over basal bone, in cases where mixed dentition treatment is indicated, solves this problem by bringing into harmony the tooth material of the maxillary and mandibular arches, permitting normal mesiodistal relationships of first permanent molars without derangement of the incisor segments.

The proper evaluation of the potentialities of a mixed dentition case as described in this paper relies upon the use of dental x-rays. Although different procedures have been suggested for use when x-rays fail to supply tooth measurements required, it is always better to take these dimensions directly from the films. Consequently, it is important that good dental x-rays be available, and there is room for much improvement in the quality of films commonly sent to the orthodontist for his use. Even films which are ordinarily considered good are sometimes guilty of enlarging teeth to an extent which

renders them of little value, a fault which could be minimized by proper technique. While the author realizes that some young patients are more difficult to work with than the average adult, he would, nevertheless, welcome technical improvements in dental roentgenography which might be generally adopted. Extraoral films are frequently more reliable than intraoral, while films taken with a longer target distance are more gratifying to work with than those taken at shorter range. It is entirely possible that a specific technique developed for the purpose might make these measurements more accurate than they are at present.

The author fully realizes that some of the assertions made in this paper do not agree with the prevalent concepts of many present-day orthodontists. In some particulars they flatly contradict time-honored teachings, statements made in the orthodontic literature, and the very philosophy of treatment under which many orthodontists conduct their practices. The statements made in this paper are, however, based upon clinical evidence accumulated over a period of twenty-six years. They consist not of personal opinion or informal impressions formulated during my years of practice, but, instead, are conclusions based on many hours of measuring done upon the records of actual orthodontic cases in which different types of appliances and different philosophies of treatment were used. These measurements have come not only from my own practice, but from other offices, from New York City to the Pacific Coast. They were not accumulated to reinforce any particular point of view, but rather to ascertain the potential attainments and limitations of orthodontic treatment. It is tedious to accumulate records of this sort, and, while I have been able to obtain a considerable number of models of cases many years out of retention, I have not obtained nearly all I should like to have. The process of collecting these data is arduous and often disappointing; I mention this not with the intention of impressing you with my own perseverance, but simply to point out that it is a time-consuming task which I, nevertheless, invite you to attempt, in the hope that my work may be either substantiated or disproved, in part or in its entirety, by other workers.

SUMMARY

1. This report is based on a large number of cases, some of which have been treated actively, and some of which have been controlled only with a preventive lingual arch for holding arch length. Most have been followed a sufficient number of years after retainers were discontinued to determine definitely whether or not the final outcome was stable. Both the stable cases and those which relapsed have been carefully analyzed by means of measurements which are herein described.

2. These measurements lead me to conclude that the length of the dental arch, from the mesial of one mandibular first permanent molar to the mesial of the corresponding tooth on the opposite side, is always shortened in the transition from the mixed to the permanent dentition. Furthermore, this arch length cannot be permanently increased in mixed dentition cases through orthodontic treatment, but, on the other hand, it will decrease. The only exceptions to this gen-

eralization are cases which show an abnormally marked lingual axial inclination of mandibular incisors,* or cases which have sustained the premature loss of deciduous canines or deciduous second molars. These exceptions are included only in the interests of accuracy and do not involve cases in which any marked increase in this distance may be expected to be maintained.

3. These measurements lead me to conclude that the distance from the mesiolingual of the mandibular first permanent molar to the mandibular midline likewise always shortens in the transition from the mixed to the permanent dentition, and that this distance cannot be permanently increased through orthodontic treatment in the mixed dentition, allowing again for the same exceptions.

4. It is possible, using the measurements described, to estimate accurately the prognosis of most mixed dentition cases, and to determine whether or not extraction will be necessary in permanent dentition treatment.

5. Active treatment in the mixed dentition period is desirable only in Class III cases, cross-bites, and Class II, Division 1 cases wherein facial appearance is markedly affected.

6. The treatment of the above cases should follow the principles discussed in this paper; that is, it must be recognized that the amount of space between mandibular first permanent molars cannot be permanently increased. Since this distance is always shortened in the transition from the mixed to the permanent dentition, the accommodation of all the teeth in the mixed dentition period in nonrotated positions constitutes overtreatment through overexpansion. The treatment of the mandibular arch in Class II, Division 1 cases requires the extraction of the deciduous canines in order to position the mandibular incisors over basal bone, without resorting to overexpansion.

7. The preventive lingual arch is useful only during a short interval of time; namely, from just prior to the exfoliation of the second deciduous molars until such time as the mandibular canines and premolars have fully erupted. Such use of the preventive lingual arch is indicated only in those cases which are given a favorable prognosis by the measurements herein described.

The author wishes to thank Dr. Wendell L. Wylie and Dr. F. W. Schubert, both members of the staff of the Division of Orthodontics, College of Dentistry, University of California, for their assistance in the preparation of this paper. Dr. Wylie assisted in the preparation of the manuscript; Dr. Schubert is responsible for the photography.

REFERENCES

1. Brodie, A. G., et al.: Cephalometric Appraisal of Orthodontic Results, *Angle Orthodontist* 8: 261-351, 1938.
2. Brodie, A. G.: On the Growth Pattern of the Human Head, *Am. J. Anat.* 68: 209, 1941.
3. Brash, J. C.: The Growth of the Jaws, Normal and Abnormal, in *Health and Disease*, Dental Board of the United Kingdom, pp. 30-31, 1924.
4. Tweed, C. H.: The Application of the Principles of the Edgewise Arch in the Treatment of Malocclusions, *Angle Orthodontist* 11: 5, 1941.
5. Black, G. V.: Descriptive Anatomy of the Human Teeth, ed. 5, Philadelphia, 1902, S. S. White Dental Mfg. Co.

*One such case has been encountered in my practice, wherein mandibular incisors were tipped so far lingually by the closed bite that uprighting in treatment increased the inside measurement to the extent that even after forward positioning of first permanent molars, a net increase remained. This rarely happens; the forward positioning of molars is usually sufficient to cancel out any safe amount of forward tipping of incisors.

THE CORRECTION OF MANDIBULAR SUBLUXATION

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THE temporomandibular articulation is important and of especial interest to every dentist because of its active participation in the function of mastication. This joint is as essential to the act of chewing as the teeth themselves.

During earlier dental practice, and in these succeeding years as an orthodontist, my attention has been called many times to this joint as a guide and stabilizer to the occlusion, as well as having been concerned with its disorders and displacements.

Just now, from my indexed file of reprints and articles taken bodily from our orthodontic and dental magazines of the past thirty years, I have been reading up on this interesting subject of mandibular subluxation which is manifested in a variety of ways as an interference with function, and the cause of discomfort in eating, singing, yawning, speech, or even immobility of the mandible. There are several points formerly taken for granted, which have received attention and correction in this period. For instance, contrary to appearance, it has been shown that in a skull of harmonious proportions the combined action of the muscles of mastication, including the pterygoid muscles, together with the buccinator, the masseter and temporal muscles, each in its own direction, join to make a parallelogram of forces which is exerted quite independently of the temporomandibular joint and at approximate right angles to the line of contact of full normal upper and lower dentures. Where the denture is normal and complete and properly placed in a symmetrical skull, the power of mastication is exerted upon the teeth in a direction which is nearly in line with their individual length, that is, parallel to the long axis of each. So, in other words, the teeth in a normal denture are, in the act of chewing, pushed directly into their sockets, and, contrary to appearances when viewing a mounted skull, the condyle, in function, does not in fact share this pressure with the teeth, either when at rest or while there is a bolus between the teeth, but merely serves as a pivotal point in the mechanism of chewing.

Though habitual dislocation of the mandible and painful crepitus have to my knowledge been attributed to arthritic conditions, I think I have never seen either such condition where the teeth were all present and in approximately normal relation. In my reading thus far, I have found nothing to disprove the opinion that disturbances of the temporomandibular joint are generally due to trauma, and are often associated with the loss of teeth and inadequate dental support.

Gray describes the temporomandibular articulation as a compensating dual joint, consisting of a condyle, disc, and fossa. The further description may be

summarized by saying that in certain movements the disc moves with the condyle, while in others the condyle moves upon it, and that this freedom depends upon a dimensional relation of all the structures in which the presence and position of the teeth are an essential part. Simon, in his studies of gnathostatics,



Fig. 1.

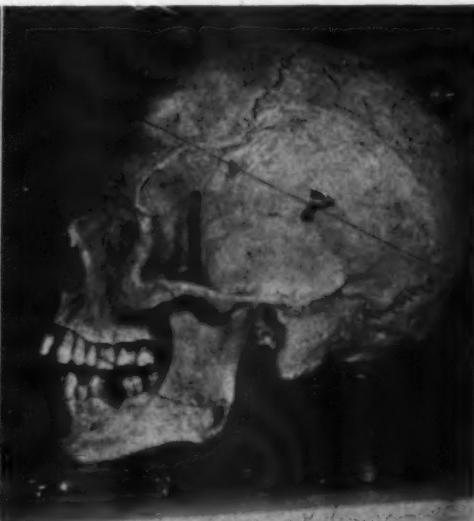


Fig. 2.

Fig. 1.—This shows the skull used in the original experiment. The teeth are in contact and the skull does not rest upon the condyle.

Fig. 2.—This shows the device in place in the skull and the dentures are separated by it. As the springs supporting the mandible of the skull do not exert normal control, the relation of the condyles to the fossae is not normal, but the excursion of the condyle toward the mesial margin of the fossa may be imagined.



Fig. 3.—This shows the device covering the second molars of the skull and establishing a fulcrum on each side across which the mandible can be tipped for the indicated exercise which will alternately tense and relax the involved muscles and ligaments, as I shall demonstrate. By gentle pressure upon the chin and the influence of the fulcrum, the condyles are lifted away from the fossae to make mild tension on the ligaments of the articulation and to tense the muscles of mastication in a manner which suggests the term, myofunctional therapy. Bearing in mind that the articular disturbance in the second case which I treated, to which I referred before, was more evident on the right side, it may be interesting to have a look at the slides of this case and see the condylar relation under different circumstances.

found that in otherwise normal dentures, and with crania of average symmetry, the distances from the infraorbital foramina to the occlusal plane showed only slight variation between the right and left sides, while the variation increased with the extent of the deformity or mutilation of the denture.

Fig. 4.

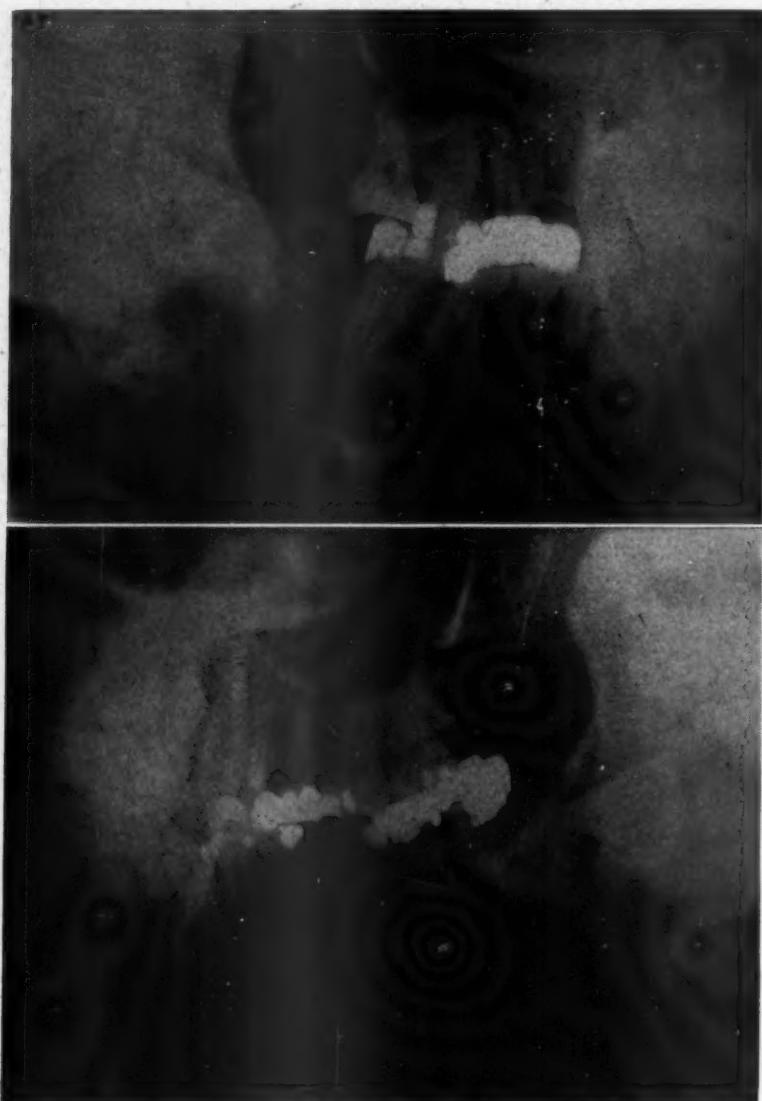


Fig. 5.

Fig. 4.—X-ray showing the left lateral jaw.

Fig. 5.—X-ray showing the right lateral jaw. The mechanical influence of the loss of a single tooth upon the position and inclination of the teeth distal to it, and upon the temporomandibular articulation, is well shown.

When using a mortar and pestle, the pestle is guided to place by the hand. When a bit of food is between the molars on one side of the mouth, the jaw moves laterally and these molars are guided to slide down into place against the food by the contact of the corresponding cusps of the molars on the other

side of the mouth. We should think of the cusps of the molar teeth and the premolars as each having two functions, that of grinding and crushing the food, and also of guiding and controlling this function from side to side, alternately. The movement stops, and the jaw is supported when the cusps of each denture

Fig. 6.

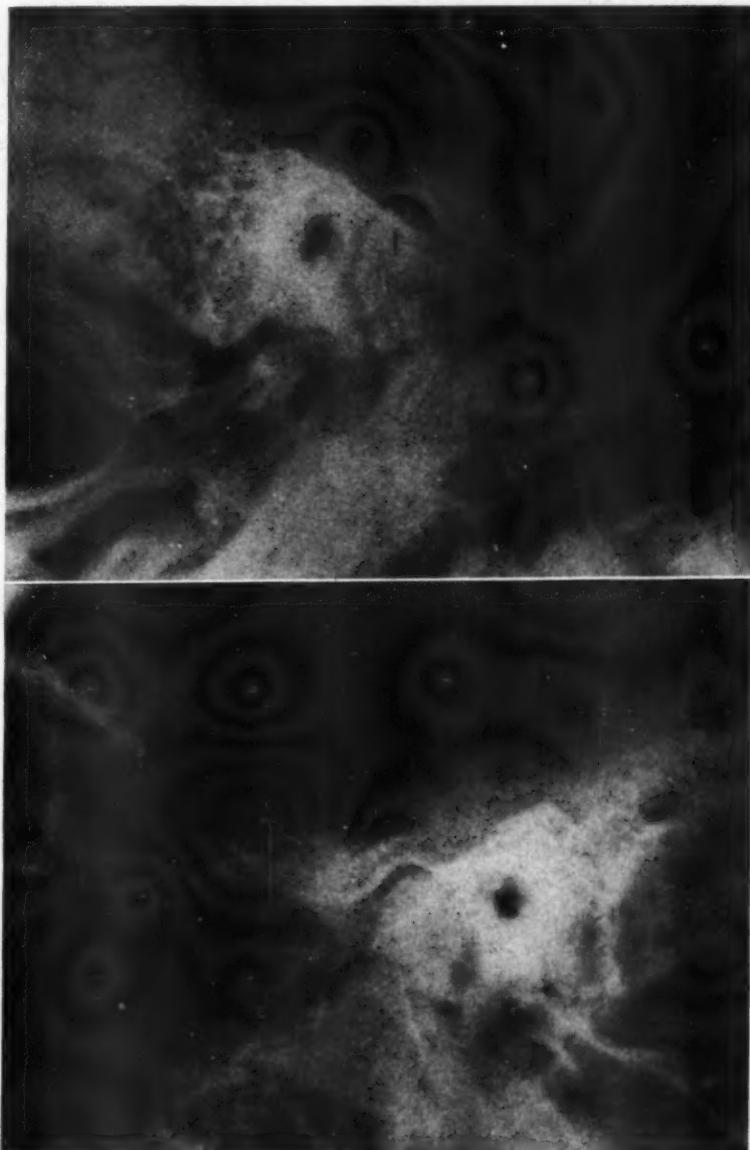


Fig. 7.

Fig. 6.—X-ray of the left condylar relation, with the mandible at rest.
Fig. 7.—X-ray showing the right side.

match into the central fossae of the opposing denture. By this arrangement, the condyles of the mandible are not under direct pressure, but move loosely in the fossae. They are also kept from overriding the margins of the glenoid fossae either anteriorly or laterally, by the condyles which work reciprocally

through concerted action of ligaments and muscles. While the fossae are restricted in area, the field is sufficiently large to permit the broad and free movement of chewing, which is multiplied greatly by the distance from the condyles to the chin.

Fig. 8.

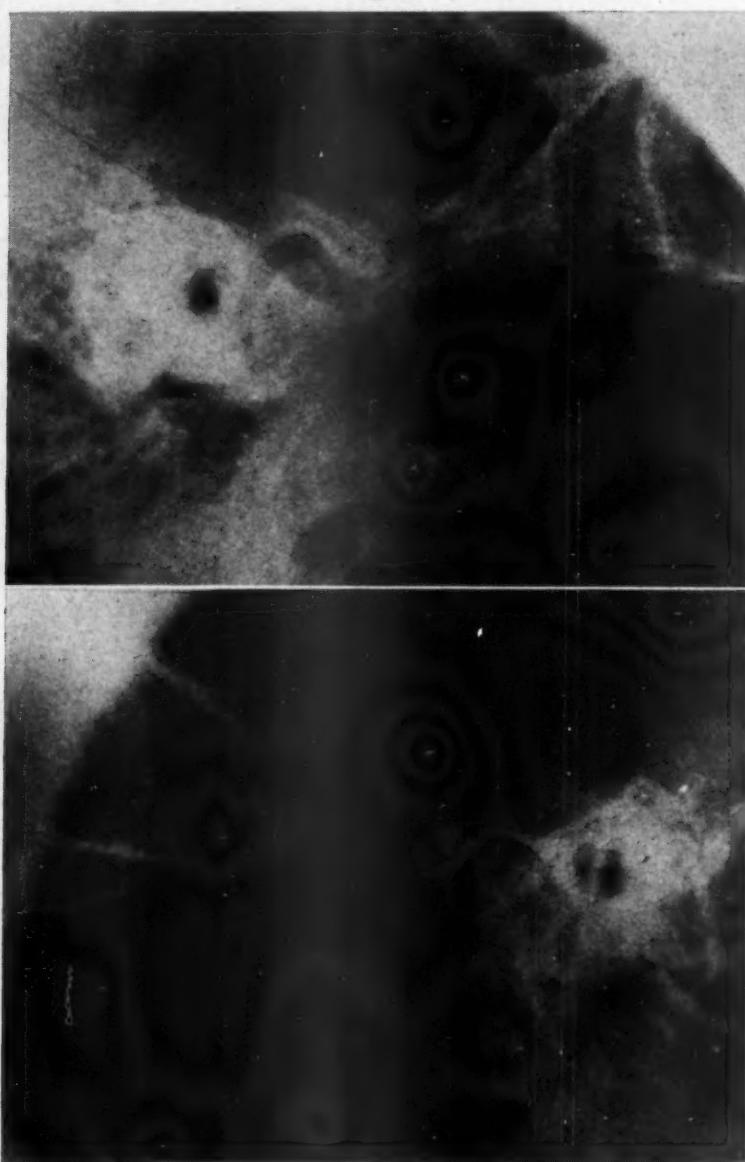


Fig. 9.

Fig. 8.—This shows the condylar relation with the mandible open, left side.

Fig. 9.—This shows the same on the right side. It may be noted that in this position the space beneath the condyle is much greater on the left side than on the right. This may be found upon further study to be an evidence that the condylar relation to the disc may be disturbed in both fossae though the mutilation of the denture is only on one side.

If the patient has molars on one side only, this function is necessarily incomplete as regards the thoroughness of mastication, and the opposite condyle also assumes a task which is as foreign to its natural relation, as would be the

effort to walk with a crutch under one arm. This condition is without doubt progressive and eventually becomes painful, and in one case I have known, the patient had resignedly ceased to make the effort to chew at all.

Fig. 10.

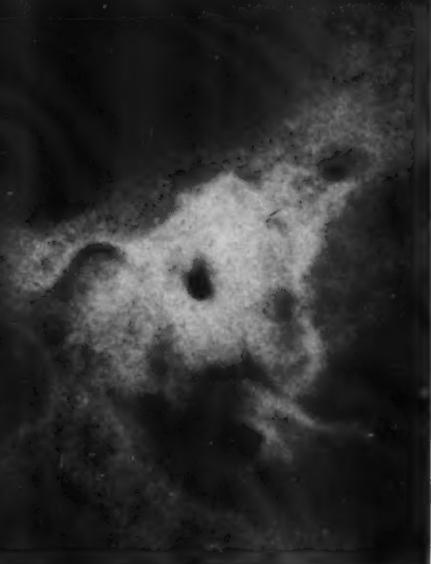


Fig. 11.

Figs. 10 and 11.—These show the same areas, but with the device in place and the mouth opened by it, thus giving equal support to the mandible on each side.

Various expedients have been tried for the correction or relief of these cases by restricting the mandibular excursion, even to the use of bands and intermaxillary elastics, but good and eminent authorities still consider the difficulty unsolved, and the outlook for relief through operative procedure (and seldom resorted to) is still decidedly uninviting. Even the more recently de-

veloped technique of taking x-rays of the joint has not served to do more than confirm the conclusions of earlier writers on this subject.

In the hope of contributing to the ultimate solution of this difficulty, I should like to tell you of my personal experience. Through carelessly and absentmindedly trying to crush a rather large piece of very hard candy between my back teeth, I had developed, after a little, a painful and noisy lesion in my own right glenoid fossa.



Fig. 12.

Fig. 13.

Fig. 14.

Fig. 12.—The patient has kindly consented to the use of her pictures to help present this paper. The first photograph shows the patient with the lips parted, and also the labial portion of the denture, which is regular and attractive.

Fig. 13.—This shows the relation of the dentures with the teeth closed upon the device, and the lips opened slightly, the contact being in the region of the second molars.

Fig. 14.—As in this picture, the patient is seated when using the device, with the elbows resting upon the table. With the fingers on the cheek bones and the thumbs beneath the point of the chin, slight alternation of pressure and relaxation is made by contracting the thumbs repeatedly.

As was to be expected, up to this time my experience in this direction had been objective only, but in this experience I had the rare opportunity of viewing the situation from a new angle. As a result of rereading some old material from my files, and a study of the skull, a picture of which I shall show you later, I took an impression of the skull and made a vulcanite device which covered the roof of the mouth partially and extended over the occlusal surfaces of the upper second molars. This lowered the chin when in place, without disturbing the relation of the condyles to the fossae, but little. The vulcanite over the molars was trimmed to be equal in height so as not to throw the mandible to one side.

As a result of this study, an impression of my own mouth was taken and a similar device was made which went to place without trimming.

The device was placed in the mouth for a few moments twice a day for a week or more, and used with a routine exercise which I suggested. This was

immediately successful in reducing the irritation, after which, the use of the device was discontinued. There has been no occasion for the further use of the device at any time.

Fig. 15 (left side).

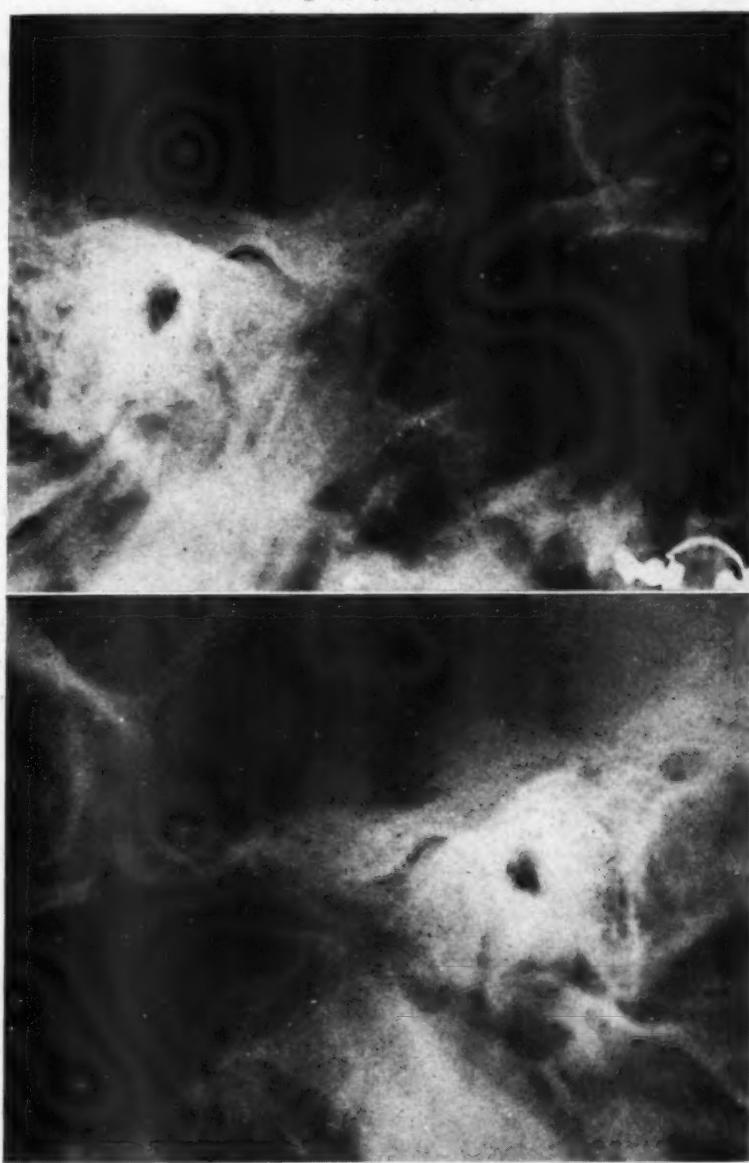


Fig. 16 (right side).

Figs. 15 and 16.—These show the left and right condylar relation with the device in place and with the stress of the exercise being exerted. The right side more nearly resembles the left side when the device is used, and the exercise confirms it. (Figs. 15 and 16 can be compared with Figs. 6 and 7.)

Almost at once there was opportunity to employ this same treatment for two other patients where the trouble had been of much longer standing. In both these cases the same routine was followed as in my own. In one of these cases the crepitus was especially trying, though mastication was not notably

painful. In the other, there was decided immobility of the mandible, the teeth could be opened but a very little way, and the twinges of pain were decidedly annoying. In the first case, though the denture was not in perfect occlusion, all of twenty-eight teeth were present. In the other, some lower teeth were absent on the same side as the articular disturbance, and others tipped, thus causing a decided deviation of the occlusal plane as was shown by comparing the angulation of the roots of the molars.

In the first case, the use of the device was continued for approximately a month and the case was dismissed with the recommendation that it be used at once in case there was any suggestion of the return of the disturbance. In the other case, the pain from chewing was definitely stopped at once, and, in addition, the immobility of the mandible was soon thoroughly overcome and the patient was able to open the mouth normally and without discomfort. In this case recently, after many months of disuse, the patient reported that infrequently there were slight twinges from chewing. On this account, the occasional use of the device was recommended as a safeguard against further discomfort. This patient is prevented by a deformity from taking ordinary physical exercise, and it seems possible that a generally relaxed musculature may be a factor here. The x-rays show that the mesial margin of the fossa has been damaged by the long-continued movement of the condyle across it.

In the use of the device, I have had the patient make this pressure, say fifteen times, twice a day at the beginning of treatment, and increase the number to fifty or sixty times after a few days. And I caution the patient not to be so forceful as to cause any sense of irritation.

It will doubtless occasion some surprise when it is noted how little motion of the condylar process is apparent during the exercise, even to the fingers placed upon it. This mobility is, of course, limited by the flexibility of the ligaments of the articulation.

In still another case there were no lower molars and only one premolar remaining on one side of the jaw, involving a specially planned approach. This patient was greatly annoyed by both crepitus and painful movement of the condyle upon the disc. Both these conditions were relieved when a suitable device was provided. The upper molars had been decidedly elongated on account of a protracted lack of contact with opposing teeth. An apparently successful effort is being made to depress them to their original position so as to re-establish the occlusal plane in better relation with the eye-ear plane, and in the hope that a proper denture will serve to make permanent the relief which was immediately experienced.

It is notable that in the many items of bibliography concerning this subject there is so often a note of futility. Repeatedly the problem is ably arraigned and some expedient is halfheartedly suggested, but there is little confidence expressed as to the outcome, and the suggestion is left without further alternative.

As a net resultant there is almost simultaneous agreement that surgery, or prosthesis, or even sclerosing by hypodermic injection as a means of alleviating

suffering, each have their special drawbacks and complications seemingly most evident where relief is most needed.

While a thoroughgoing inquiry may disclose the primary cause of the lesion, recourse to either one of these proceedings can at best only permanently confirm the perverted function of the mutilated tissue. When other possibilities fail or are contraindicated, there still remains a resource in the study of the sequence of interferences by which the established lesion has been reached, and it is here that it is hoped to find the basis of successful treatment.

While there is nothing obscure or complicated in the construction of the device, it has been apparent to me that these cases vary greatly, and that accurate study models of dentures, and a full series of x-rays of the involved areas, in process, will be desirable guides to establishing the individual treatment which may be required, while a casual and less studied approach could result in disappointment.

Experience in the treatment of these cases confirms the conclusion that each case of mandibular subluxation is the result of its own combination of adverse conditions, and that there is no formula or device which is equally corrective for all; but it is reassuring to feel that in many cases discomfort may be relieved and that a cure may be effected if approached with an understanding which reaches back to the original provoking cause.

Too much cannot be said for the cumulative value of ample case records, and their frequent comparison, as helps to final success in treatment of obscure cases in this somewhat unfamiliar area.

The deductions and conclusions of this investigation may be summarized in the following statements:

1. Injuries such as the displacement of the cartilage or the breaking down of the anterior marginal ridge of the glenoid fossa are apparently permanent.
2. The variety of sensations and the wide range of discomforts experienced by patients suffering from mandibular subluxation suggest, for each manifestation, a corresponding definite point of irritation.
3. Successful therapy requires a consistent effort to localize accurately the primary and provocative lesion within the glenoid fossa itself.
4. This can only be satisfactorily accomplished through study of occluded models of the denture and adequate x-rays of the fossae and condyles in the full range of the abnormal relation of the parts, in the process of their correction.
5. Permanent relief involves a corresponding adjustment of the action of the muscles of mastication and of the ligaments associated in the whole articular assembly.

REPORT OF THE NOMENCLATURE COMMITTEE OF THE AMERICAN ASSOCIATION OF ORTHODONTISTS

At the forty-second annual meeting held in Chicago in April of 1944, this Committee submitted a majority report which included a list of terms which we felt would promote a more correct orthodontic language and improve our literature. It represented more than two years of effort superimposed upon the deliberations of previous committees and arrived at after consulting language authorities interested in our problem. It contained forty-six terms with accompanying definitions which we felt were adequate for the time being and would constitute a start toward an official nomenclature for our specialty.

A minority report was also submitted which took issue with the majority report, questioning our language usage, and as a result a special committee was named at the meeting to consider these reports and censure or correct them. As a result of their action, 34 of our 46 terms were either eliminated, changed, or modified. This report of the special committee, however, was not accepted by the membership and, by motion duly voted, the whole matter was referred back to the Nomenclature Committee whose members were instructed to report at the next meeting.

Since that time, your committee has continued its consideration of this subject in conjunction with several consultants, some of whom, in addition to their interest, have had long experience in teaching orthodontics. This time we are pleased to submit a report which represents the approval of all of our members. It includes a list of terms not greatly different from the one submitted at the Chicago meeting, and which is appended as a part of this report. We are submitting this *not for adoption as official terminology of this Association, but for consideration and study by our membership* in the hope that it may play a part in developing a more correct descriptive language for our specialty. We are hopeful that those interested will submit to our committee *in written form, during the coming year*, modifications, changes, or additions which will be constructive in character. We are conscious of the fact that any list of terms is susceptible to improvement, but if we are ever to achieve an official nomenclature, a start must be made.

It is unfortunate that the average orthodontist assumes such a lethargic attitude toward a descriptive language for our specialty. This is evident in our literature, where term usage is frequently confusing. One of our consultants writes this observation: "The average professional man's knowledge of nomenclature in either medicine or dentistry is very meager, and you will find teaching them proper terminology requires patience similar to teaching children their ABC's."¹ The editors of our orthodontic journals are helping materially in this situation, as are also teachers of orthodontics, who realize their responsibility and who desire to be specific in their terms and definitions.

One teacher makes this statement: "Good descriptive words come into being through use and constant repetition. For instance, words and expressions used by educators are quite often adopted by students and later expressed in their writings and conversation, and gradually come to have a generally accepted meaning."² The American Board of Orthodontics has also rendered a service by furnishing to candidates a list of terms (acceptable but not compulsory) in the preparation of theses and case reports. This suggestion has resulted in an improvement and greater uniformity of material submitted for their judgment.

Those who follow our literature closely realize that few articles upon nomenclature appear. The past year, however, produced one of unusual merit, which was published in the December, 1945, issue of *The Journal of Dental Education*. Its author is Ashley W. Lindsay and its title "A Comparable Nomenclature for Dentistry." This notable contribution should be studied by those who seek a better nomenclature not only for dentistry but for its specialties. I quote a few of his pertinent statements: "Not having grown up in the

family of medical-practice specialties, and because of the overweighted emphasis on the place of odontalprosthesis in its therapies, dentistry has not given adequate attention or consideration to nomenclature employed in passing eras of its history; nor is it yet adopting basic principles on which to pattern its present-day growing nomenclature. A similar criticism has been made regarding medical-practice terms; a casual survey discloses an apparent medley. This might easily lead one to believe that there has been little coherent thought given to their coinage. A closer study, however, proves this not to be the case, for it is readily apparent that medical-practice terms adopted during the last two generations have been logically based on a classical pattern employing for the most part Greek-root nouns with approximate suffixes. . . . A few dental terms are a legacy of the early days of the profession; the larger number are the results of unsystematic and erratic attempts by a specialty, a faculty, an editor, a writer or teacher to evolve as the need arose a term or terms without the benefit of any standards. To aid in the recognition of the aptness and adequacy of terms and to understand the method of their formation, an enumeration follows of the suffixes which have commonly been added to Greek and Latin substantives to form scientific terms and names for modern medical and dental specialties. These suffixes are: *-ia*; *-ics*; *-ology*. The suffix *-ia* is used as an ending to feminine nouns, usually to abstract and to neutral plurals as regalia, paraphernalia; also in forming names of diseases as neuralgia, hysteria; names of countries as Tasmania; names of alkaloids as morphia, atropia; names of genic plants as dahlia, wisteria; names of festivals, as Saturnalia; names of the animal kingdom, as mammalia, reptilia; various other names as sephia, bacteria. In all uses of the suffix *-ia*, there is no example given of a use to form the names of medical-practice specialties. It seems clear that dentistry had no justification in employing the *-ia* suffix in the forming of such names as exodontia, prosthodontia, periodontia. We should, therefore, today consider such names as obsolete." Your committee feels that Dr. Lindsay's contribution is of such great value that permission for its republication in the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY should be sought for the benefit of our members.

One consultant who read Dr. Lindsay's article at our request gave us this reaction: "To me as a mere onlooker, up to this point, I can see that there must be, somewhere, sources of definite information on some of the fundamental terms which are used in orthodontics. Anyone who searches for a true descriptive terminology for our specialty should and must be unprejudiced from the start. If, as, and when words which are commonly used today are proved unauthentic, they should be replaced with correct words."³

That a healthy difference of opinion exists is manifest by the fact that some of the terms discarded by the special committee at the last meeting are defended by well-qualified teachers in several of our better dental schools. Among these are the terms "eugnathic anomalies" and "dysgnathic anomalies." One states: "I have the following comments to make concerning the list of terms recommended for approval by the American Association of Orthodontists: Your terms 'eugnathic' and 'dysgnathic' interest me a great deal. I have grave doubts, however, concerning their acceptance by 'the run-of-the-mill' membership, although there is nothing objectionable about them and I think they are well taken."⁴ Another makes this observation: "I agree with the other professor about the use of the terms 'eugnathic' and 'dysgnathic.' I looked in Gould's medical dictionary and also in Dorland's long ago to convince myself, and I have been using the terms for years. Just the other day I saw no less than thirty good reasons in medical terminology for the adoption of these terms officially into our language."⁵ Still another teacher who seeks scientific accuracy in definitions states: "Sometime in the near future, there should be a more comprehensive and explicit definition of the term 'normal occlusion,' which we all use frequently, but interpret to fit our individual conception. Also, there should be an attempt to differentiate between 'ideal occlusion,' 'normal occlusion,' 'functional occlusion,' and 'malocclusion,' for we know that there is no clear-cut distinction between them, but rather a blending by slight variation, one into another. I would like to call to your attention the expression, 'generally accepted standards' which was used in nine different definitions. This expression is vague and no two dentists would agree completely on what constitutes 'generally accepted standards.' Therefore, again we should attempt to be more specific."⁶

Another, after studying our list of terms, writes: "In your definitions of 'mesioversion' and 'distoversion' there is what I believe an unfortunate use of the terms 'mesial' and 'distal.' I must confess that I am as guilty of this misuse as anyone, but I think that properly those two words should be reserved only for describing relationships in the parabolic curves of the dental arches, and that when they are extended to describe jaw relationships they become confusing. Let me elaborate on that point: If a lower lateral incisor is too far mesial, it is too close to the medium sagittal plane. If a lower second molar, however, is too far mesial, it is too close to the orbital plane. When we apply these terms 'mesial' and 'distal' only to teeth, it is understood that we are referring to relationships along the parabola; but when we talk about a jaw being too far mesial or distal, I think we are guilty of a misuse of the term. I should like to see orthodontists use 'anterior' and 'posterior' or derivatives of these two terms to describe what Angle calls Class II and Class III relationships."⁴

Still another consultant, the head of the orthodontic department of a prominent university, writes us as follows relative to our list of terms: "I do feel that the list of terms has been developed satisfactorily and while it probably does have imperfections it will serve as a definite start and should be accepted, subject to change as experience dictates the wisdom of use. I have no idea that any of us can ever work up a large list that will be acceptable, but a small group of words may be added from year to year giving us a sound foundation. I see no reason to add or discard any words from the list. I would leave in the terms 'eugnathic' and 'dysgnathic.'"⁵

From the foregoing it will be apparent that the nomenclature committee faces a task which will not be terminated in a short period of time. We are hopeful, however, that each passing year will register progress. At our last meeting someone made the suggestion that the annual budget should include funds for the employment of a professional philologist to overhaul our terminology and bring it to a better degree of uniformity. No action was taken in the matter. Perhaps this may still be done. One of our members deeply interested in this subject writes me as follows relative to this suggestion: "I believe that when different individuals consult local authorities on language and classical roots, it leads in the ultimate committee meeting to a comparison of the relative ranks of different local authorities consulted, with the final decision possibly influenced on the basis of personal loyalty rather than the intrinsic merits of the various points of view. Furthermore, I think the authority in question will give better attention to his facts if he accepts the responsibility that is contingent upon accepting a fee and if he knows that he is the one person in the country selected for advice in the matter."⁶

In closing this report we earnestly seek your interest in and study of all the matters outlined, to the end that our specialty may enjoy the benefits of a correct and uniform terminology.

Respectfully submitted,

KYRLE W. PREIS²

GEORGE R. MOORE⁶

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Consultants

O. W. White, American Board of Orthodontics¹

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A LIST OF TERMS RECOMMENDED FOR STUDY BY THE MEMBERS OF THE AMERICAN ASSOCIATION OF ORTHODONTISTS

Orthodontics

A noun, indicating the science which has for its object the prevention and correction of dental and oral anomalies.

Orthodontic

An adjective, describing or referring to orthodontics.

Orthodontically

An adverb, implying manner of action.

Anomaly

An aberration or deviation from the normal or generally accepted standard in anatomic growth, development, or function.

Dental Anomaly

One in which the teeth have deviated from the normal or generally accepted standards of form, position, or relationship.

Oral Anomaly

One which includes the tissues or anatomical parts forming the mouth cavity, including the teeth.

Eugnathic Anomaly

One limited to the teeth and their immediate alveolar supports.

Dysgnathic Anomaly

One which extends beyond the teeth and their immediate alveolar supports, and includes the soft and hard tissues of the maxillary region, the soft and hard tissues of the mandibular region, or a combination of the soft and hard tissues of the two.

Dentofacial Anomaly

Term indicating a dysgnathic anomaly.

Macrognathia

Indicating a definite overgrowth of the jaw or jaws.

Micrognathia

Indicating a definite lack of growth of the jaw or jaws.

Macroglossia

A definite overgrowth of the tongue.

Microglossia

A definite lack of growth of the tongue.

Myofunction***Myodysfunction***

Referring to the normal function or to the malfunction of muscles.

Normal Relationships***Malrelationships***

Terms applied to conjoining structures as they should be in accordance with generally accepted standards or with this relationship disturbed or disrupted.

Normal Dental Function***Dental Malfunction***

Terms to indicate the correct or incorrect action of opposing teeth in the process of mastication, sometimes referred to as "normal occlusion" and "malocclusion."

Normal Occlusion of the Teeth***Malocclusion of the Teeth***

Terms indicating the relations of the opposing teeth when brought into habitual opposition and fulfilling generally accepted standards, or when such relationships are disrupted.

Anterior***Posterior***

Terms to describe relative positions in a forward or backward direction.

Unilateral One side

Bilateral Both sides

Maxillary Superior jaw

Bimaxillary Superior and inferior jaws

Mandibular Inferior jaw

Terms indicating the part or extent of the jaws affected.

*Symmetrical**Asymmetrical*

Terms indicating the manner of their involvement.

(a) *Contraction**Distraction*

Terms to indicate teeth or other maxillary and mandibular structures too near the median plane or too far (in an outward direction) from it.

(b) *Protraction**Retraction*

Terms to indicate teeth or other maxillary or mandibular structures too far forward (anterior) or too far backward (posterior) from the normal or generally accepted standard.

(c) *Attraction**Abstraction*

Terms to indicate teeth or other maxillary and mandibular structures too high or too low in the face from the normal or generally accepted standard.

(a) *Intraversion**Extraversion*

Terms to indicate teeth or other maxillary and mandibular structures which are too near or too far from the median plane.

(b) *Anteversion**Retroversion*

Terms to indicate teeth or other maxillary and mandibular structures too far forward (anterior) or too far backward (posterior) from the normal or generally accepted standard.

Supraversion

A term to indicate teeth which have erupted beyond the usual occlusal plane.

Infraversion

A term to indicate teeth which have failed to erupt to the usual occlusal plane.

Linguoversion

A term indicating malposition of teeth too far inward or toward the tongue.

Torsiversion

A term indicating malposition of teeth axially rotated.

Mesioversion

A term indicating malposition of the jaws too far anterior and, when used in reference to teeth or a tooth, signifying teeth or a tooth closer to the median plane or midline than the generally accepted normal position.

Distoversion

A term indicating malposition of the jaws too far posterior or, when used in reference to the teeth or a tooth, signifying teeth or a tooth farther away from the median plane or midline than the generally accepted normal position.

In Memoriam

BRYAN J. McGINNIS

BE IT RESOLVED that the Southwestern Society of Orthodontists has lost one of its outstanding members in Bryan J. McGinnis. He was a graduate of the Baltimore College of Dentistry. Following his graduation, he came to Texas and was associated with Dr. S. D. Terrell, who at that time was in Ranger, Texas. Subsequently, he practiced in San Antonio, then spent one year with Dr. Ed. Arnold in Houston. Later he opened his orthodontic practice in Beaumont, Texas.

Dr. McGinnis was a man with an exceedingly brilliant mind, and he had a faculty for remembering to a detail things learned or heard twenty-five years previously. He was a man who was loved by all who knew him.

BE IT FURTHER RESOLVED that the Southwestern Society of Orthodontists has lost one of its esteemed members, and that its members wish to extend to his bereaved family their heartfelt sympathy. And be it also resolved that this shall be spread upon the minutes of the society and a copy of same sent to his family.

Respectfully submitted by the Resolutions Committee,

GEORGE HERBERT, Chairman

O. S. MATTHEWS

H. B. BOLT

CHARLES RUSSELL

S. D. TERRELL

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Unerupted Teeth Which Have Been Surgically Exposed and Brought Into Occlusion: By A. J. Walpole Day, H.D.D., L.D.S., *Dental Record* 64: 269-274, November, 1946.

Teeth which have failed to erupt for one reason or another have far too long been regarded by the majority of the dental profession as a problem for surgical extraction instead of a problem for the orthodontist. Most dental surgeons must at one time or another have removed the gum over a premolar tooth which was having a difficult time in erupting, but few have done the same for a buried incisor tooth.

The four cases described in this article are chosen from a series of cases in which experimental treatment was given to unerupted teeth in order to bring them into occlusion.

The first experiments were designed to ascertain if, when all obstruction was removed, an unerupted tooth would erupt into its normal position or, if not into its normal position, into such a position that it would be a simple orthodontic procedure to bring it into line. It is, of course, obvious that if the unerupted tooth is grossly misplaced, such as in the case of a canine tooth lying in the palate, mechanical as well as surgical treatment would be required. The first cases to be treated were those in which the unerupted teeth were in such a position that eruption along the line of the axis of the tooth would bring it into a reasonable position. The first case treated, a girl aged 9 years, had a retained |A and |1 unerupted. The x-ray showed the |A in position with a supernumerary immediately above it and the |1 immediately above the supernumerary. The exact position of these teeth was verified by taking x-rays from various angles. Under a local anesthetic, an incision was made and a flap of mucoperiosteum reflected, the |A and the supernumerary were removed, and the tissue around the buried |1 explored. The tissue in the immediate vicinity of the crown of the |1 was cut away with some bone, and the flap of mucoperiosteum was then stitched back into position, except for a small piece which was removed so that the crown of |1 should remain exposed. This aperture was then packed with B.I.P.P. gauze to prevent the gum healing over again. This, however, was not completely successful, and the crown of |1 had to be exposed again six months later to facilitate eruption. Two years after the initial operation, the tooth was in position, but crossed over |1, and this was subsequently corrected by an appliance.

The next case was a boy, aged 9 years, with two unerupted upper central incisors and two unerupted supernumeraries. This case was treated in exactly the same way and followed the same course, except that mechanical aid was given to help the eruption of the teeth after a wait of only fifteen months.

It was found that zinc oxide and oil of cloves, into which a little wool was incorporated, was a more satisfactory dressing than B.I.P.P., which was easily washed away. It was also found that the removal of bone around the crown of the unerupted tooth helped to speed the process of eruption.

At first, the rate of eruption is quite rapid, but it gradually slows down. In the younger patients it is possible that complete eruption would take three years, but in the older patients it is doubtful if the unerupted tooth would ever completely erupt without mechanical assistance.

The fact that the teeth erupt at all is of great help in treatment, because it is possible to put a band or cap onto a partially erupted tooth and thereby to bring it into occlusion, which technique is always preferable to drilling a hole into the tooth and attaching a ring to it.

The unerupted canine in the palate had essentially the same problem, but with a big difference. Since the direction of eruption was along the line of the long axis of the tooth, merely exposing the crown portion of a canine tooth lying horizontally in the palate would not be beneficial, and the gum would eventually heal over the unerupted tooth if some means to prevent this were not employed.

The cause of the canine in the palate is due to the failure of the temporary canine to absorb before the crown of the permanent canine starts on its downward course. The tip of the permanent canine crown is palatal to the apex of the temporary canine root and not labial as so many people imagine, so that failure to absorb in the early stages causes palatal displacement of the permanent tooth.

The technique adopted in these cases was to localize the tooth by x-rays and to expose as much of the crown as possible under a local anesthetic. The gum flap was then sewed back into position, with the portion immediately over the crown cut away. This aperture was then packed with zinc oxide and oil of cloves, or B.I.P.P. gauze, for about a week or ten days. At the end of this time, a small cavity was prepared in the palatal aspect of the tooth and a small ring was cemented into position. This is done as follows: an elliptical cavity is prepared and undercut with a wheel bur. A piece of stainless-steel wire is bent into the shape of a ring, so that the free ends will just enter the long axis of the cavity. The ring is then rotated through 90 degrees so that the ends become fixed in the undercut. Cement is then flowed round the ring to fill the cavity and fix the ring. (American orthodontists do not as a rule find it necessary to drill holes in these teeth. J. A. S.)

J. A. Salzmann

Management of Injuries to Stensen's Duct: By Lieutenant Colonel Saul C. Newman, and Colonel Seabrook Dean, B. M. C. A. U. S., *Ann. Surg.* **134**: 544-556, September, 1946.

Injury to Stensen's duct, comparatively rare in civilian life, was met with much more frequently as the result of war injuries. Because of their greater experience with this lesion, the authors were able to evolve a method of pre- and postoperative care, as well as new methods of operative technique, which have yielded remarkably satisfactory results.

Treatment of parotid duct fistulas is divided by the authors into three categories depending upon the anatomic location:

1. Fistulas in the glandular area.
2. Fistulas over the masseter muscle.
3. Fistulas anterior to the masseter muscle, or in the buccinator area.

Fistulas in the glandular area, if connected with the main duct or a main tributary, the best treated by surgery. Operative procedure recommended by the authors is as follows:

A. Prior to Surgery.—

1. Lipiodol injected into the fistula and into the oral opening.
2. Daily dilatation and probing with graduated flexible probes of the oral opening of the papilla for approximately ten days.
3. Twenty-five thousand units of penicillin every three hours intramuscularly for twenty-four hours before surgery.

B. Surgery.—A detailed description of the operative procedure elucidated by schematic drawings is presented.

C. Postoperative Care.—Twenty-five thousand units of penicillin every three hours is started immediately on the day following operation.

Ten milligrams of pilocarpine hydrochloride is given at 10 A.M., 3 P.M., and 8 P.M. daily. In addition 1 Gm. of ammonium chloride is given with each meal. Large quantities of fluids by mouth are administered, and oral hygiene is carefully observed.

Five cases are reported in detail and several x-ray pictures elucidate the text.

The authors feel that salivary fistulas of the parotid gland and parotid duct respond favorably to appropriate treatment regardless of chronicity. They also stress the importance of preserving the duct papilla.

Harry A. Salzmann, M.D.

Root Canal Therapy: By Louis I. Grossman, D.D.S., Dr. med. dent. Second Edition, revised and enlarged. Octavo 354 pages. 94 engravings. Cloth. Price \$5.50. Philadelphia, Lea & Febiger, 1946.

This second edition of Grossman's book offers a condensed and thorough discussion of problems encountered in root canal therapy. It strives for a more successful conservative dentistry in providing comfort as well as safety to the patients, and also in clearing away many misconceptions with regard to the so-called "dead teeth" which still promote countless unnecessary extractions.

The anatomy, physiology, and pathology of pulp and periapical tissues are comprehensively studied. Importance is stressed of proper examination and diagnostic measures that point toward pulp conservation, pulp extirpation, or tooth extraction. Also, included and discussed in this book are present-day refinements in the practice of root canal therapy, such as the application of sulfonamides, penicillin, tyrothricin, streptomycin, and other antibiotic agents for endodontic treatment. Aerodontalgia, which undoubtedly will play an important role in the practice of dentistry in an ever increasing air-minded world, is included in dealing with causes of pulp injury.

The book provides sound and practical aids in the handling of root canal problems, and thoroughly discusses preparation, sterilization, bacteriologic examination, and filling techniques. A new chapter in the treatment of fractured and traumatized anterior teeth is contained in this edition, as well as a section on the treatment of deciduous teeth by Elsie Gerlach, D.D.S. This book is recommended as a safe guide toward better practice in endodontics.

Carlos Giró

The Dentist's Own Business, A Practical Study in the Management of a Dental Practice With Due Consideration of Its Ethical Responsibilities: By Arthur A. Campbell, D.D.S. Illustrated. Pp. 113. Wire-O binding. Price \$3.50. Philadelphia, The Blakiston Company, 1946.

This book is especially directed to young men entering dental practice and to the returning veteran, although it may be found of value by any practitioner of dentistry. A section is devoted to the dentist and another to the assistant. Each is closely related so that the dentist and his assistant may well read both sections. Campbell pointed out that a dentist can be a good businessman and still be a failure. There are many factors that contribute to the success of the individual dentist. Practical examples are provided in office management routine. Such subjects as examination, fee estimates, payment arrangements, and collection are fully covered. Chapters are devoted also to the dental hygienists, children's dentistry, and the management of investments.

J. A. Salzmann

Oral Medicine: Diagnosis and Treatment: By Lester W. Burkett, D.D.S., M.D., Professor of Oral Medicine, The Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania; Professor of Oral Medicine, Graduate School of Medicine, University of Pennsylvania. With a section on Oral Aspects of Aviation Medicine by Major Alvin Goldhush, D.D.S., M.S., D.C., A.U.S. 350 illustrations (60 in color on 10 plates). Pp. 674. Price \$12.00. Philadelphia, J. B. Lippincott Company, 1946.

It is a far cry from the volume on *Oral Medicine* of which Burkett is the author, to the works on the subject which appeared not so many years ago. In this volume are presented the various oral conditions which largely make up the no man's land that lies between medicine and dentistry. The many relationships between oral and systemic diseases are fully described and illustrated. The material is presented from an intensive, practical point of view. A perusal of this book by the dentist will tend to make patients' histories more meaningful. As it is, most of the information elicited in dental history-taking remains meaningless. Burkett's description of the examination of the patient includes the psychological approach, laboratory procedures, and other methods, in addition to clinical observation.

In a special color atlas a group of 60 subjects is presented, illustrating oral lesions most commonly encountered by the physician and dentist. These colorings are arranged in such a manner as to make it possible to use them in conjunction with the diagnostic index which follows. The diagnostic index itself presents a classification grouping of the principal oral diseases, for ready reference for study. Section 4 of this volume is devoted to the discussion of diseases of the various systems of the body in relation to their oral aspects. Included are the diseases of the respiratory system, under which are presented the oral findings in common colds, ear and throat inflammations, and others. Under diseases of the cardiovascular system, we find discussion of the oral aspects of angina pectoris, coronary occlusion, and other cardiac disturbances. Under gastrointestinal diseases are included the various diseases of the mouth, the salivary glands, and those of other sections and systems.

Focal infection is discussed in detail, as are dental pediatrics, gerodontics (the treatment of dental disease in the aged), the hazards of dental practice, and dental diseases of occupational origin.

Applied Orthodontics: By James D. McCoy, M.S., D.D.S., F.A.C.D., Associate Clinical Professor of Oral Surgery, School of Medicine, University of Southern California, Los Angeles, Calif. Formerly Professor of Orthodontics in the College of Dentistry, University of Southern California. Sixth edition revised. Two hundred twenty-seven engravings and four plates. Philadelphia, 1946, Lea & Febiger.

This is an excellent textbook that has for its purpose the production of an introductory text to the field of orthodontics. The author makes it plain in the preface to this edition that it is to be hoped that the book will stimulate its readers to seek all additional sources of information to the end that they will assemble a complete over-all picture of all the problems related to the field of dentofacial orthopedics. Previous editions were dedicated to the same purpose. The sixth edition, however, is more complete and discusses in more detail the changes taking place during the current years that affect orthodontic thinking.

The book adheres rather closely to fundamental principles of orthodontic practice which have stood the test of time and have become well established in modern clinical practice.

It is a highly specialized textbook for the student of dentistry and for the reader who applies himself to groundwork reading in preparation for more comprehensive departments of practice. Advanced reading of the printed record of the development of orthodontics as an art and science is recommended by the author.

The book includes a short but interesting chapter devoted to the indications for the use of the roentgen ray in orthodontics. That chapter is particularly interesting reading for the practitioner who is interested primarily in the orthodontic information to be gained in the systematic x-ray examination of his cases, and it will afford a quick reference for the busy practitioner.

The author stresses the modern view point that the student of orthodontics should not be concerned chiefly with mechanical methods of moving teeth into position, but that he should develop as well a biologic approach to the problem. He points out that the reader must become biologic- and physiologic-minded first in order that he may intelligently use mechanical devices for the correction of malocclusion.

Here is a creditable digest not only of the author's methods and ideas of the orthodontic concept, but also of the contributions of many of the leading authors upon the subject during the past years of progress.

The book should be read not only by the student, but it also makes sharp and to-the-point reading for the everyday practicing orthodontist.

H. C. P.

News and Notes

1947 Convention of the Pacific Coast Society of Orthodontists

Six years is a long time between conventions. The first postwar convention of the Pacific Coast Society of Orthodontists was to be held at the Palace Hotel in May, 1946, and the program was planned. However, the railroad strike began the day before the scheduled meeting, and it was postponed indefinitely.

By periodic visits to the various sectional groups, President J. Camp Dean and his associates kept the fires of enthusiasm and interest at a high pitch during the war. The officers of the Pacific Coast Society of Orthodontists are to be congratulated upon their interim activities and hard work.

The first regular session of the 1947 meeting opened at 9:15 A.M. on Monday, February 24, with an address of welcome by the popular and well-loved Dean of the College of Physicians and Surgeons of San Francisco, Ernest G. Sloman. In the President's address, J. Camp Dean covered the six years of inactivity in a masterful fashion. To Will Sheffer went the task of making the charge to thirty-six new members. The new "orthodontic oath" puts membership in our society upon a higher plane, and gives the "neophyte" an incentive toward better work and closer cooperation with his colleagues.

With the preliminaries over, a series of papers by essayists from the four main sections of the United States were given. Charles A. Sweet of Oakland was our first speaker. He has retired from active practice to assume the role of Assistant Professor of Operative Dentistry at the College of Physicians and Surgeons, where he can teach future students to pay more attention to children's dentistry. Dr. Boyd W. Tarpley and Dr. Frank P. Bowyer, stressed the "guide plane" as an aid in treatment. They proved to be true disciples of Oliver, Wood, and Irish.

During luncheon, all phases of orthodontic practice were covered by round-table discussions. This form of dispensing information is gaining in popularity at each convention. It was under the direction of George Hahn of Berkeley.

Spencer Atkinson was the first afternoon speaker. From his research laboratory on Sierra Madre Mountain, he brought skulls, slides, sections, and photographs to prove his points on arch form, skull shapes, so-called *basal bone*, and normal occlusion.

The next paper, "Endocrinopathies," was read by Sydney Cross. Mel Chipman, of the Pacific Northwest discussed Sydney Cross' paper. He put much thought and effort into the discussion, and many roentgenograms to bring out the effects of the endocrines upon the teeth and their bony supporting structures were displayed.

At the end of the first day a stag banquet was held.

Tuesday was devoted entirely to clinics. It is impossible to give a detailed account of each clinic; a list follows:

1. "Skull Duggery." Spencer Atkinson, Pasadena, California.
2. "Several Odds and Ends That Help in Treatment." George R. Barker, Seattle, Washington.
3. "Dr. Alexander Sved's Adaptation of the Hawley Retainer." J. Camp Dean, Oakland, California.
4. Cleft Palate Cases Can Be Helped—Changes in Facial Musculature Subsequent to Orthodontic Treatment. C. F. Stenson Dillon, Los Angeles, California.
5. "Adjustable Molar Tube—Retaining Appliances to Complete Treatment." Walter J. Furie, Long Beach, California.

6. "Occipital Anchorage." Ernest L. Johnson, San Francisco, California.
7. "Cases of Special Interest." Charles W. Konigsberg, San Francisco, California.
8. "Special Instruments and Their Use With Chromium Alloys." Ray McClinton, Burlingame, California.
9. "Addition of Bite Wire to Hawley Retainer to Maintain Positive Mesiodistal Relation of the Jaws." John R. McCoy, Los Angeles, California.
10. Interesting Cases and Their Treatment—"Pliers for Making Tie Brackets." E. C. Read, Long Beach, California.
11. "Contracting Wire With an Expanding Coil Spring." J. E. Richmond, Eugene, Oregon.
12. Photographs of Cases—"Why Upper Right Centrals Are Often Fractured in Girls." L. R. Sattler, Los Angeles, California.
13. "An Improved Appliance for Treating Upper Impacted Cuspids." Allen E. Scott, San Francisco, California.
14. "Mechanical Aids in Class 2 Cases of Malocclusion." C. E. Thompson, Glendale, California.
15. "A Practical and Adjustable Bite-Plane and Retainer." E. W. Tucker, Seattle, Washington.
16. "Spot Welder." Noble A. Powell, Beverly Hills, California.
17. "Dean Retraction Coil." Roy Dean, Mexico, D. F.
18. "Use of Continuous Archwire Adjustment as an Aid in Treatment of Bimaxillary Protrusions." Irwin Steuer, Cleveland, California.
19. "Exhibit of Twenty-Five Cases Treated With Sliding Twin Section Mechanism and Retained With the Modified Positioner Technique." Clarence W. Carey, Palo Alto, California.
20. "Retention." Fred E. McIntosh, Los Angeles, California.
21. "Treatment Deviations to Obtain Satisfactory Results—With Models and Photographs." Walter J. Straub, San Francisco, California.
22. "Removable Anterior Section for Hawley Retainer Symmetrical Pin and Tube Attachment for Chrome Alloy Lingual Arch." Leland Carter, San Francisco, California.

On Wednesday, the session opened with some marvelous pictures by Sanford Moose, Clinical Professor of Oral Surgery of the College of Physicians and Surgeons. The title of his illustrated lecture was "Intraoral Division of the Ramus for Surgical Correction of Excessive Mandibular Protrusion, and Preoperative Use of External Skeletal Fixation for Prevention of Fracture and Maintenance of Mandibular Dimension. He showed the possibilities for handling Class III cases.

The next paper by Dr. Francis M. Pottenger, of the Pottenger Clinic for Children at Monrovia, California, was entitled "Some Nutritional Factors in Dental Deformity and Suggested Measures for Control." Since diet has such an important bearing upon our cases, we as orthodontists must, at least, be able to recognize these deficiencies. Since our field is the treatment of the malocclusion, the treatment for undernourished patients should be placed in the hands of competent and cooperative physicians who are trained in such work.

Originally from the Middle West but now of Portland, Oregon, Dean Harold J. Noyes, University of Oregon Dental School, gave a very learned paper entitled "Does Function Contribute to Facial Growth and Form?"

The paper, "Intelligent and Thoughtful Diagnosis and Treatment Planning," was given by Stenson Dillon.

At the final business session, the following officers were elected:

President-Elect, Stenson Dillon, Hollywood.

Vice-President, Fred Wilson, San Francisco.

Secretary-Treasurer, Frederick West, San Francisco.

With the presentation of the past-president pin by Ben L. Reese of Los Angeles, the twentieth general meeting of the Pacific Coast Society of Orthodontists was brought to a close.

Northeastern Society of Orthodontists

The Northeastern Society of Orthodontists (formerly the New York Society of Orthodontists) held its annual meeting on March 10 and 11, 1947, at the Waldorf-Astoria Hotel in New York City. The program follows:

Monday, March 10, 1947

"A Concept—A Comparison—and a Conclusion." John Mather Jackson, D.D.S., Philadelphia, Pennsylvania.

"Changes in the Dental Arches as a Factor in Orthodontic Diagnosis." J. H. Sillman, D.D.S., New York, New York.

"The Treatment of Malocclusion in the Light of Newer Knowledge."—Part I. Samuel J. Lewis, D.D.S., Detroit, Michigan.

President's Address.

"Treatment of Class II, Division I (Angle) Occipital Anchorage." Bercu Fischer, D.D.S., New York, New York.

"Progressive Malocclusion Associated With Dilantin Medication." D. Robert Swinehart, D.D.S., Baltimore, Maryland.

Tuesday, March 11, 1947

"Case Analysis and Treatment Planning Based Upon the Relationship of the Tooth Material to Its Supporting Bone." Ashley E. Howes, D.D.S., New Rochelle, New York.

"Rational Orthodontic Treatment." Donald D. Osborn, D.M.D., Providence, Rhode Island.

"Practice Management." George M. Anderson, D.D.S., Baltimore, Maryland.

"Treatment of Malocclusion in the Light of Newer Knowledge—Part II." Samuel J. Lewis, D.D.S., Detroit, Michigan.

Clinics supplementing papers were given by the following:

1. Samuel J. Lewis, D.D.S.
2. Donald D. Osborn, D.M.D.
3. Bercu Fisher, D.D.S.
4. D. Robert Swinehart, D.D.S.
5. Joseph K. Gold, D.M.D.

The Officers, Board of Censors, Executive Committee, and Advisory Committee of the Northeastern Society of Orthodontists are as follows:

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Central Section, American Association of Orthodontists

The Central Section of the American Association of Orthodontists held its annual meeting at the Hotel Radisson in Minneapolis, Minnesota, on April 14 and 15, 1947. The following programs were presented.

Monday, April 14, 1947

Address of Welcome. H. G. Ramstead.

President's Message. C. S. Foster.

Observations on Certain Aspects of Current Orthodontic Practice. Bernard G. DeVries.
Mandibular Prognathism. Carl W. Waldron and Ralph G. Peterson.

Case Report: Two Failures Showing the Results of Orthodontic Treatment. Howard E. Strange.

The Orthodontic Program of the Michigan State Department of Health. George R. Moore.

Assumptions Concerning Orthodontic Diagnosis and Treatment. L. Bodine Higley.

Case Report: Treatment of Impacted Cuspids. Henry F. Westhoff.

Case Report: The Value of Predetermined Arch Dimensions and Form "Setups" as a Diagnostic Aid in Orthodontic Treatment Planning and Post-Treatment Maintenance. Howard Yost.

Clinics and Exhibits were held on Monday evening.

Tuesday, April 15, 1947

Details of Management Conducive to Better Service and Patient-Clientele Relationship. Leonard P. Wahl.

Rational Procedure in Orthodontic Treatment. G. Vernon Fisk.

Early Recognition of Certain Deviations From Normal Dentition, and Applied Therapy. R. C. Willett.

The Functional Analysis of Malocclusion of the Teeth. John R. Thompson.

A Class I Case With Blocked-Out Mandibular Second Premolars. Arthur C. Rohde.

Johnson Club

At the recent meeting of the Johnson Club held on January 20, 21, 22, 1947, in Louisville, there was a total registration of two hundred eighty-nine, including sixty local dentists.

The geographical distribution of registration is interesting—three men from California, one from Maine, four from Canada, six from Florida, and five from Texas. The remainder came from practically every section of the United States.

Probably the highlight of the meeting was the banquet honoring Dr. Joseph Johnson. The speakers at the banquet were Dr. Atkinson and Dr. A. P. Williams, of Louisville, and Dr. Joseph D. Eby of New York. The latter presented Dr. Johnson an inscribed plaque appropriately worded, as a token of appreciation of Dr. Johnson's students and friends.

The first announcement of the meeting was sent out last July. Invitations were sent to those men who had taken one of Dr. Johnson's courses in New York, Michigan, or Atlanta. Invitations were also sent to a few men who for a long time had been using the twin arch, were personally known to Dr. Johnson, and had spent time in his office as students.

At a business meeting (luncheon) on the first day of the meeting, the Johnson Alumni Club was organized. The club accepted the recommendations of the organization committee which, briefly, were that the Johnson Alumni Club would be an informal organization (without constitution and by-laws); that biennial or triennial meetings would be arranged so as not to conflict with other regular orthodontic societies; that luncheons would be held at the time of the American Association of Orthodontists if they would not conflict with any of its plans; that the membership in the club would not be limited to those men who had taken one of Dr. Johnson's courses, but would be open to any orthodontist interested in the philosophy of the twin arch technique; that there would be no dues but that the expenses of the organization would be met by assessment when funds were necessary.

The club re-elected the same committee to carry on the work. This was not a recommendation of the organization committee but seemed to be the unanimous opinion of those present.

The committee recommended the formation of study clubs to study twin arch philosophy, and one such club has been formed in New York City. Plans are being made for another such club to be located in Chicago.

FRANK LAMONS, Chairman

COMMITTEE OF THE JOHNSON CLUB

Dr. Ashley Howes, New Rochelle, N. Y.
Dr. Henry U. Barber, New York City, N. Y.
Dr. John Richmond, Kansas City, Kan.
Dr. Harry Keel, Winston-Salem, N. C.
Dr. Frank Clifford, Kokomo, Ind., Secretary

Dentistry for Children

Steps to establish dental health councils in all communities to provide more dental services for children were launched here today at a national conference on dentistry for children.

Meeting under the joint sponsorship of the Council on Dental Health of the American Dental Association and the American Society of Dentistry for Children, leading specialists in children's dentistry agreed that American children are receiving only a fraction of the dental care they need.

Dr. Oren A. Oliver, of Nashville, Tennessee, reported that recent surveys reveal that each American child, on the average, has five or more dental defects at the present time.

Dr. LeRoy Johnson, of Columbus, Ohio, estimated that it would take more than 400,000 dentists, approximately six times the present total of dental practitioners in the nation, to correct existing dental defects in the mouths of the American people.

The conferees voted unanimously to enlist all local units of the dental profession in a nationwide campaign to increase dental service for children.

According to Dr. Oliver, nearly 60 per cent of all dental practice today is devoted to the replacement of teeth lost through disease and neglect, leaving insufficient time for treatment and care of children.

Dr. Oliver estimated that the cost of replacing teeth with artificial dentures is approximately three hundred million dollars annually.

"Prevention would be much cheaper," he said.

"The cost of preventive and protective dental services, begun at an early age, is relatively small and is probably not beyond the financial ability of a very large majority of the population. The cost of overcoming dental neglect is, on the other hand, not only high and therefore unattainable by many, but it is an unnecessary cost which would have been avoided by adequate care in childhood."

The conference voted to conduct a nation-wide survey to determine the actual amount of dental service now available for children in each locality. Dental schools were also urged to place more emphasis on children's dentistry in undergraduate training for dental students.

American Dental Association

Dr. Lon W. Morrey, of Evanston, Illinois, well-known authority on children's dentistry, has been named editor of *The Journal of the American Dental Association*.

Dr. Morrey was elected to the post by unanimous vote of the Association's board of trustees, according to an announcement by Dr. Sterling V. Mead, of Washington, D. C., President of the American Dental Association.

The new editor succeeds Dr. Harold Hillenbrand, of Chicago, who was elected general secretary of the Association at the 1946 meeting of the House of Delegates in Miami, Florida, last October.

Dr. Morrey is the fifth editor of *The Journal of the American Dental Association*, which was first published in Chicago in 1913. The publication, issued twice monthly, now has a

national circulation of 70,000 and reaches approximately 90 per cent of the nation's practicing dentists. Dr. Morrey was also named editor-in-chief of the Association's companion publication, *The Journal of Oral Surgery*.

For the past thirteen years, Dr. Morrey has served as Director of Public Relations and Dental Health Education for the American Dental Association. In that post, he has conducted a continuing national campaign to increase dental health services for children, particularly in preventive dentistry.

Dr. Morrey is the author of numerous books and pamphlets on dentistry and dental health. Among his recent books are *Teeth, Health and Appearance*, and *Care of Children's Teeth*.



Lon W. Morrey

He is a graduate of Chicago College of Dental Surgery, dental school of Loyola University. He first practiced dentistry at North Chicago, Illinois, and later became school dentist at Lake Forest. In 1927, he became director of the dental division of the Illinois State Department of Public Health, at Springfield, and from 1928 to 1933, served as director of the dental division of the Chicago Board of Health.

Dr. Morrey is a member of the Chicago and Illinois Dental Societies, the American Dental Association, the American College of Dentists, the American Society of Dentistry for Children, and *Psi Omega* and *Omicron Kappa Epsilon*, dental fraternities.

He is also a member of the governing council of the American School Health Association, a member of the Board of Directors of the Chicago Tuberculosis Institute, and a fellow of the American Public Health Association.

Dr. Morrey is married and has one son. He resides at 940 Judson Avenue, Evanston.

Army Medical Library Microfilm Service

During the war, the Army Medical Library, through its photoduplication services, supplied millions of pages of microfilmed medical articles to the armed services and other research agencies. The principle of immediate aid direct to the user, wherever he might be, introduced a new technique to assist medical research.

This service is now generally available for civilian physicians, institutions, and research workers on a cost basis. This means direct access to the library's enormous resources of medical literature.

A fee of fifty cents is charged for filming any periodical article in a single volume, regardless of length. Microfilming from monographs is furnished at fifty cents for fifty pages or fraction thereof. Photostats are also available at a charge of fifty cents per ten pages or fraction thereof. Material filmed is not for reproduction without permission of the copyright owner.

For convenience and to keep bookkeeping costs down, a coupon system has been established. Users may buy any quantity of photoduplication coupons at fifty cents each. Order blanks are available upon request. Checks should be made payable to the Treasurer of the United States, and sent to the Army Medical Library, 7th Street and Independence Avenue, S. W., Washington 25, D. C.

The Czechoslovak Stomatological Congress

The Czechoslovak Stomatological Society will hold a congress in Prague from June 11 to June 15, 1947, in celebration of the fiftieth anniversary of its foundation. Simultaneously, that is on June 11 and June 13, the Tenth Annual Congress of the A.R.P.A. Internationale will be held in Prague.

The sponsoring society invites all friendly organizations and their members to attend both scientific meetings.

The official languages of the Czechoslovak Stomatologic Congress will be Czech and Slovak; lectures announced in advance may be spoken in English or French.

For information, please apply to Spolek ceskych zubnich lekaru, Praha II., Sokolska 31, Lekarsky dum.

Notes of Interest

Frank W. Nash, D.D.S., is pleased to announce that Walter H. Fordham, Jr., D.D.S., will be associated with him in the practice of orthodontics, 801 Medical Arts Building, Scranton, Pennsylvania.

Dr. Charles H. Patton announces the association of Dr. Robert B. Hedges in the exclusive practice of orthodontics, 235 S. 15th Street, Philadelphia 2, Pennsylvania.

Lawrence Pearlman, D.M.D., announces the opening of his office, 17 Bay State Road, Boston 15, Massachusetts, practice limited to orthodontics.

Dr. Leo M. Shanley announces the association of Dr. Edward V. Degnan in his office, 7800 Maryland Avenue, St. Louis, Missouri, practice limited to orthodontics.

Dr. Alice Tweed announces the opening of her office for the exclusive practice of orthodontics, 2304 Huntington Drive, San Marino 9, California.

Virgil C. Wanek, B.S., D.D.S., M.S., announces the opening of his offices at 904 North Eighth Street, Sheboygan, Wisconsin, practice limited to orthodontics.

It has been announced by St. Louis University School of Dentistry, St. Louis, Missouri, that after June 1, 1947, Dr. Kenneth C. Marshall of the Orthodontic Graduate School of the University of Michigan, School of Dentistry, will be connected with its Orthodontic Department.

Dr. Marshall was formerly a Captain of the Army Dental Corps; he served in the Aleutian Islands and in the O'Reilly General Hospital in Springfield, Missouri.

OFFICERS OF ORTHODONTIC SOCIETIES

The AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY is the official publication of the American Association of Orthodontists and the following component societies. The editorial board of the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY is composed of a representative of each one of the component societies of the American Association of Orthodontists.

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In the January issue each year, the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY will publish a list of all of the orthodontic societies in the world of which it has any record. In addition to this, it will publish the names and addresses of the officers of such societies.